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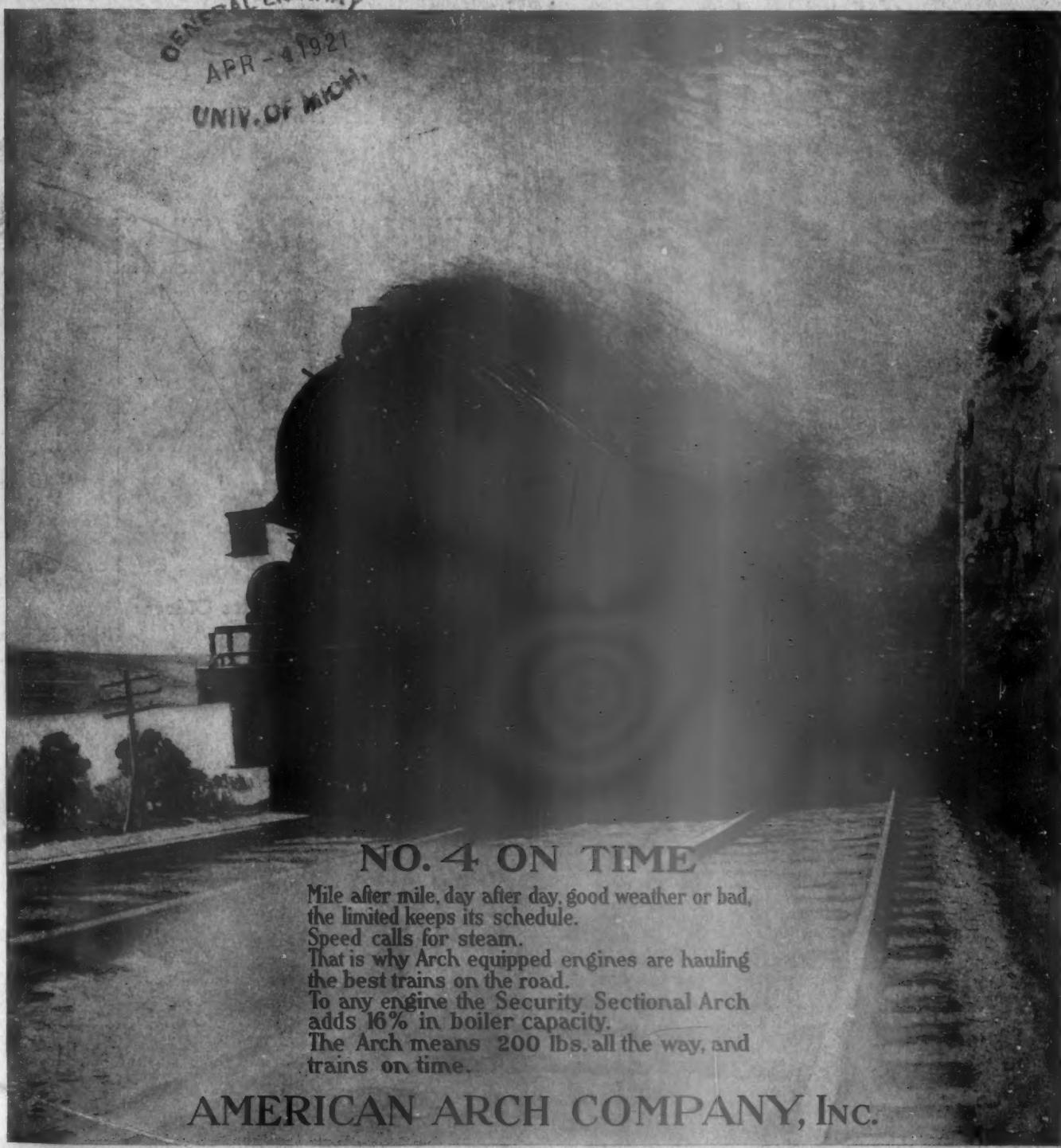
Railway Age

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SIXTY-SIXTH YEAR

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EDITORIAL



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One middle western railway has a painting schedule that calls for the painting of one-seventh of its bridges each year.

**Keep Up
the Painting
Schedule**

In other words, each bridge is painted at intervals that average very close to seven years. Of course, some of the structures require attention oftener than others, but seven years represents the average for the entire system, including the great variety of exposures which tend to cause paint failures to occur more rapidly in some localities than in others. Seven years is by no means a short interval for what may be termed the average conditions. Nevertheless, the structures on this railroad are in very good condition as regards the paint surfaces and it is the opinion of the bridge engineer that the success attained in maintaining this painting schedule may be ascribed primarily to the policy of the management in adhering to the program year after year; the bridges are not allowed to get into a condition that calls for large expenditures for cleaning or scraping before the new coat is applied. It goes almost without saying that a coat of paint applied over one that still has some life left in it is going to last much longer than one applied over a coat that has entirely disintegrated. Herein lies one danger in the present situation. Curtailment of painting this year may result in much greater expenditures in overcoming the harm done to the surfaces on steel bridges in the years to come. Deferred painting is much more expensive than painting done before extensive scraping and wire brushing becomes necessary.

In his report to the Interstate Commerce Commission on the Porter, Ind., accident W. P. Borland, chief of the Bureau

**Is a Double
Signal System
Necessary?**

of Safety said that "the locations of the train-order and home signals were such that it would have been possible for the fireman to have mistaken the green indication of the train-order signal for a clear indication of the top blade of the home signal if the light on the latter was out or obscured by steam or smoke." This raises the question as to the necessity for the continued use of a double signal system since one system can and should be made flexible enough to meet all requirements of train operation by signals. At the present time two systems for the operation of trains are in common use, one consisting of the time table, the train-order and the telegraph or telephone and the other the automatic block signal and interlocking system. Both systems are designed to do one thing—to enable the trains to move over the road with safety and despatch. It is true that the train-order signal system was the first in use, but is it necessary to retain this system after traffic conditions have warranted the installation of automatic block signals and such installations have been made? Each system is largely independent of the other and progressive managements are now directing their efforts towards the co-ordination of the two into one well rounded system. It is realized by operating officers and signal engineers that many "potential danger points" (commented on editorially in the *Railway Age* for March 25, page 775) such as the one at Porter, Ind., exist and they realize further that "something" should be done to eliminate this condition.

"Something" will be done when the railroads conclude that one flexible system is desired—not one superimposed on the other. It is difficult and sometimes unwise to change from old established practices too rapidly but if progress is to be made along any line old practices must give way to new. Railroad officers can well consider the advisability of requiring the automatic block signal system to be self-contained and so complete as to meet all signal requirements. In this way they will obtain greater and better operating results on the initial investment made. The proper co-ordination of signal systems will also remove "potential danger points."

**Selling
Railway Supplies
in Brazil**

Brazil, as is pointed out by J. P. Risque in an article appearing elsewhere in this issue, is a country as large as the United States, the British Isles, the Netherlands, Portugal and Switzerland combined. In spite of this great area, it has a population of only 24,000,000 and only 13,340 miles of railways, 30 per cent of which is owned by British capital. The possibilities of future railway development and the consequent growth in the market for railway supplies is plainly evident from these figures. During and since the war American manufacturers have been able to hold the lead in railway supply exports to that country, but it is significant to note that before the war made it impossible, Brazil imported more railway supplies from little Belgium than from any other country—and this in spite of the large British investment in the railways of the country. During the past year there has been a marked tendency in almost every foreign market for orders to drift away from American manufacturers and back into their pre-war channels. This tendency can be checked only by conscientious and effective effort by American exporters. Effective efforts make necessary a study of foreign markets. A study of Brazil will bring out the fact that Portuguese and not Spanish is the language of the country, a fundamental fact the ignorance of which has made ineffective many otherwise well planned selling campaigns of American concerns in that country. It is to be hoped that our exporters will supplement the activities of the financiers who are trying to finance our foreign trade by studying such fundamental facts concerning the prospective markets, so that ignorance in this essential may not set at naught an otherwise well laid plan of commercial expansion.

**Shop
Piece Work
Systems**

At one time or another, piece work systems have been developed and used in practically all branches of railroad repair shop work. Locomotive machine, boiler and blacksmith shops, also car shops, both passenger and freight, have enjoyed increased output due to the installation of piece work systems by which men are rewarded in proportion to their industry and ability to produce. While it is true that a large number of shop men are opposed to piece work, either honestly or through disinclination to do a day's work for a day's pay, some of the most ardent advocates of piece work systems are

found among shop employees and workmen. It is generally admitted that the need of the day is greater production in all branches of industry including transportation, but under present standardized wages in railroad shops, superior workmen are brought down to the level of inferior ones by the absence of incentive for greater production. There is urgent need for the re-establishment of piece work in railroad shops to increase production and decrease maintenance costs. To be successful, a piece work system must be simple with fair prices set by capable, efficient inspectors. Satisfaction with the wage scale is absolutely necessary in order that the men will do their best work and the first requisite of a piece work system is that, due to its simplicity, any workman can compute quickly his actual earnings. The next important thing is the method of setting the price. It is self-evident that a price should not be set for a job unless the piece work inspector can produce a man from the ranks to do the work at that price and make 25 to 50 per cent over his day rate. Practically all the benefits of a piece work system will be nullified if rates are cut as soon as they become remunerative to the employees. With a fair price, experience has shown that no limit should be placed on earnings due to an increase in the personal efficiency of workmen. It has been maintained that the quality of work produced in shops under piece work systems is inferior, but this conclusion has never been borne out in actual practice. With a competent force of inspectors, the inspection of work is thorough under piece work systems, and when men have had to do work over once or twice on their own time, an immediate improvement in the quality of work will soon be evident. The fallacy of this old argument against piece work systems on the ground of inferior workmanship has been long since exposed.

We publish elsewhere in this issue an article entitled "Thieving and Pilfering on the Railroads," which was prepared

"Thieving and Pilfering on the Railroads" by Alexander F. Lyman, general attorney of the New York Central. The article would be of timely interest if it ended with its analysis and discussion of the causes for the serious epidemic

of dishonesty which is helping to drain railroad revenues. It is in its proposal of a remedy for this situation, however, that the paper merits close attention. Mr. Lyman presents a plan for criminal law bureaus, to be established by the carriers jointly in each of the big railroad centers where, naturally, thieving and pilfering reach their most alarming proportions. Another feature is the suggestion for reorganized police departments, called departments of surveillance, to carry out the work of the bureau on each road. It is claimed for the plan that it has a two-fold merit. It offers real economy by concentrating in one organization, jointly maintained, the needs of the individual roads for representation in the criminal courts. That there is considerable need for this economy is indicated by recent figures from the Freight Claim Division of the American Railway Association which show that during November, 1920, 180 roads reported robberies of goods valued at \$807,438, while during the same period their losses of entire packages and their unlocated losses, neither of which were officially classed as robberies, totaled \$1,790,451. A conservative estimate, based on these figures, placed the total cost to these roads of dishonesty during November at approximately \$2,000,000. In addition to its economy, it is claimed that the proposed organization offers a maximum of efficiency. By concentrating the entire attention of a well-trained personnel on securing adequate protection for all the participating carriers, the plan does away with the lack of co-ordination which is making possible much of the present dishonesty. It would no longer be easily possible for men discharged by one road on grounds of dis-

honesty, to find employment and a chance for further depredations with another carrier if these bureaus of surveillance were established to check up the past records of all applicants. Furthermore, it has been proved that those roads which have provided themselves with efficient police departments and energetic criminal counsel, enjoy comparative immunity, while the thieves concentrate on less well-protected roads. A joint criminal law bureau, looking after the interests of all, would, it is argued, strengthen these weak spots and offer a solid, well-fortified front to thieves and pilferers.

Passenger Traffic Under Increased Rates

A FREQUENT topic of conversation during recent weeks has been the falling off of passenger travel and most railroad men have probably had to listen to sarcastic suggestions that they raise fares again to make up for the loss of revenue caused by the loss of traffic said to result from the advance in rates. It is surprising how many people think they can correctly judge the railroad situation by their personal observations during occasional business trips. Passenger travel, like most other kinds of business, has certainly fallen off during the winter and we hear of many trains carrying but a few passengers, but statistics of passenger travel and the earnings of the railroads from passenger service as compiled by the Interstate Commerce Commission fail to bear out the common impression that the passenger business of the railroads has been greatly reduced by the increases in fares put into effect on August 26, although it has, of course, failed to keep up the usual increase from year to year.

Statistics of passenger revenues are now available for five months after the increased rates were made effective, September to January, inclusive. They show an increase of revenues of about 15.6 per cent as compared with the corresponding months of 1919, resulting from an increase in rates of about 20 per cent. The number of passengers carried and the distance they traveled are not yet available for any later period than December, but figures for four months show a slight *increase* in the number of passengers as compared with the corresponding months of 1919 when the lower rates were in effect, although a slight decrease in the average journey, indicating doubtless a reduction in the amount of long distance travel, with the result that passenger mileage, the number of passengers carried multiplied by the mileage they traveled, was only 2 per cent less than for the corresponding four months of 1919. That the long distance travel should have fallen off is not surprising when it is considered that a large proportion of travel is for business purposes and business generally has been at a low ebb during the winter. Moreover, the long distance travel is more likely to be in Pullman cars and therefore subject to the 50 per cent surcharge. The big bulk of railroad passenger business, however, does not consist of long distance travel but of short trips of less than 40 miles on each railroad at an average cost of a little over one dollar, and this appears to have been very slightly affected by the increased rates so far as the statistics now indicate. During September, October and November there was an actual increase in the number of passengers.

In September the passenger revenues were \$129,438,552 as compared with \$110,219,099 in September, 1919; in October they were \$114,044,152 as compared with \$99,033,423; in November \$106,829,660 as compared with \$92,475,222, and in December \$115,060,511 as against \$100,080,515. Preliminary returns for 194 roads for January also show an increase in passenger revenues of 14.6 per cent as compared

with January, 1920. The passenger revenues, number of passengers carried, average journey per railroad, total number of passengers carried one mile, average fare paid and average rate per mile, according to the Interstate Commerce Commission reports, have been as follows:

PASSENGER REVENUES		
September	1920-21	1919-20
September	\$129,438,552	\$110,219,099
October	114,044,152	99,033,423
November	106,829,660	92,475,222
December	115,060,511	100,080,515
January	104,777,000	91,437,000
194 roads	\$570,149,000	\$493,249,259

NUMBER PASSENGERS CARRIED		
September	104,351,950	103,204,614
October	99,118,514	99,322,004
November	96,783,429	95,239,268
December	99,181,982	100,805,201
	399,435,875	398,571,087

AVERAGE JOURNEY PER PASSENGER		
September	41.25 miles	41.84 miles
October	37.95 miles	38.99 miles
November	36.35 miles	37.17 miles
December	36.71 miles	37.73 miles

PASSENGER MILEAGE		
September	4,318,000,000	4,294,000,000
October	3,716,000,000	3,872,000,000
November	3,518,000,000	3,540,000,000
December	3,640,000,000	3,803,000,000
	15,192,000,000	15,509,000,000

AVERAGE FARE PAID PER TRIP PER RAILROAD		
September	\$1.23	\$1.06
October	1.14	.997
November	1.097	.97
December	1.153	.991

AVERAGE RATE PER MILE		
September	2.99 cents	2.54 cents
October	3.022 cents	2.556 cents
November	3.019 cents	2.609 cents
December	3.142 cents	2.626 cents

Of course, travel has been lighter during the winter than during the fall months but these figures show that a similar decrease took place during the preceding year. Many people argue strenuously that if the railroads would reduce rates they would make more money by inducing more people to travel. Those who make such assertions forget that in order to reduce rates to persuade some people to travel more or oftener (except by special rates such as are being offered for summer excursions), it would be necessary to throw away the corresponding percentage of revenue from the large number of passengers who have been traveling under the present rates. They also forget that during the past two or three years when the railroads were carrying just about all the passengers they could accommodate at lower rates they were steadily earning deficits most of the time. It is easy enough for a man to say that he knows that if rates were lower he would travel oftener. The question is whether enough such people could be induced to take enough more trips at a rate which the railroads could afford to make to offset the reduction in revenue which would result in the ordinary business. Past experience indicates that without a reduction in expenses the railroads could not carry enough passengers at any lower rate to break even.

For the five months ending January 31 the passenger revenues of the railroads were \$570,000,000 as compared with \$493,000,000 in the corresponding period of 1919-20, an increase of 15.6 per cent. For the four months ending December 31 the number of passengers carried was 399,435,875, as compared with 398,571,087, an increase of 0.2 per cent, but because of the reduction in the average journey per railroad from 38.8 miles to 38 miles, the passenger mileage was 0.2 per cent less. For the five months the berth and seat revenues of the Pullman Company increased 13 per cent; under a 20 per cent increase in rates, although for November, December and January the expenses were so great as to produce a net loss.

Railway Labor Costs and Financial Results

THE RAILROADS constitute a great industry and their successful operation demands the application of the same principles and methods as the successful management of any other business. The principal requisite to the successful management of a business is the prompt and constant adjustment of expenses to earnings.

The railroads are now in a different position from that ever before occupied by any other industry. The rates they may charge are fixed by one government body, the Interstate Commerce Commission, or by a large number, if we include the state commissions and legislatures. The working conditions and wages of their employees, which determine their payroll, are fixed by another government body, the Railroad Labor Board. Their payroll constitutes over two-thirds of their operating expenses, and even with a normal traffic consumes over one-half of their earnings. With the present volume of traffic the payroll is consuming close to two-thirds of their total earnings.

Since the solvency of any business concern, or class of concerns, depends upon prompt adjustment of its expenses to its earnings, and since one government body controls the charges the railways may make and another government body controls the working conditions and wages that principally determine their payroll, it follows that unless both these government bodies act intelligently, promptly and harmoniously in the performance of their functions the results to the railroads must be disastrous. Disaster to them means disaster to the public, because upon the ability of the railways to earn a reasonable net return depends, first, their ability to meet their financial obligations, and, secondly, their ability to so enlarge their facilities that they will be able to handle the commerce of the country when business is active.

The foregoing statements are obviously true, and yet although the railways have for months been engaged in a desperate struggle to avert a general bankruptcy, the threat of which is due to the heavy decline of traffic and earnings which has occurred while their unit costs, especially those of labor, are the highest they ever were, they have not in this terrible crisis received any substantial assistance either from the government body that fixes their rates, or the government body that determines the working conditions and wages of their employees. No blame for this attaches to the Interstate Commerce Commission. It could not reasonably be asked to make any advances in rates under present conditions. Can it likewise be said that no blame attaches to the Railroad Labor Board?

The Labor Board last summer granted an advance in wages which it was estimated amounted to over \$600,000,000 a year, but which recent statistics of the Interstate Commerce Commission indicate, while traffic was still heavy, was running over \$700,000,000 a year. Its wage award continued the indefensible standardization of wages throughout the country which was adopted under government control. Over the protest of representatives of the railways it took jurisdiction of and continued in effect the standardized rules and working conditions which were adopted under government control. The railways, when the board five months later gave them a hearing on national agreements, took only a month to present their case. Almost two months have now passed since the railways finished presenting their case. The spokesmen of the labor unions were said by the Labor Board itself to have presented their main case in favor of these agreements in the wage hearings which ended last June. Nevertheless, at this most critical time, the Labor Board has allowed the labor leaders one delay after another in presenting their rebuttal to the case of the railways; and further delays which seem indefensible are yet in prospect.

In an effort to meet the desperate crisis through which they are passing the railways have laid off hundreds of thousands of men. They are not doing maintenance, rehabilitation and improvement work which are imperatively needed. In spite of all the retrenchments that have been made their financial results are indescribably bad. The Labor Board in one of its decisions has said that "all questions involving the expense of operation or necessities of the railroads, and the amount of money necessary to secure successful operation thereof, are under the jurisdiction not of this board, but of the Interstate Commerce Commission."

The Transportation Act mentions seven specific points the board must take into consideration "in determining the justness and reasonableness of such wages and salaries or working conditions," but adds that these are to be taken into consideration "among other relevant circumstances." It seems plain that the effect of wages and working conditions on the financial condition of the carriers is a "relevant circumstance." In fact, when, in the decision just quoted the board added, "if any of these rules and working conditions are unjust and unreasonable they constitute an unwarranted burden upon the railroads and upon the public," it practically conceded that the effect produced upon the financial position of the carriers by wages and working conditions was a "relevant circumstance." Nevertheless, thus far the board seems to have proceeded upon the assumption that the effect which its action, or failure to act, may have in preventing or precipitating financial disaster to the railroad industry is a circumstance which it is no part of its duty to consider.

The situation presents an anomaly in business management and in government regulation. The board is an administrative body, and the first consideration of every governmental administrative body in the performance of its duties should be the public welfare. The board, with its control over two-thirds of the expenses of the railways, has the power not only to see that the employees are fairly treated, but also that the railways are not so unfairly treated in respect to wages and working conditions that they will be ruined. It must be plain to members of the board that the ruin of the railroads is not in the public interest. The board was created by Congress by the passage of the Transportation Act. One of the plainest and most important purposes of that act was to put the railways on their feet financially so that they would be able to render better and more adequate service to the public. The ruin of the railroads will not help to carry out this purpose. It will defeat it.

The Railroad Labor Board has most important duties and an enormous responsibility under present conditions, and if it does not perform its duties in accordance with the spirit and plain intent of the Transportation Act, and the result is a great disaster to the transportation industry, the public will not and should not fail to hold it responsible.

"Corresponding Members"

THE SUCCESS of an association in the railway field as elsewhere is measured almost directly by the character of its committee work. With active committees, the work of the association will be constructive; without it, probably mediocre. Likewise, one of the most important advantages to the individual membership in an association is the opportunity which is offered for the joint study of problems confronting the industry.

No association has been more successful in developing constructive committee work than the American Railway Engineering Association. From the date of its inception its work has been based upon this foundation. Last year 25 committees with an aggregate enrollment of over 500 members were at work and the reports which were presented at the recent annual convention were the result of the mature

investigations and deliberations of these groups of men for periods up to three or four years. The value of their conclusions requires no demonstration. Yet, even in this large organization only about one-fourth of the membership was assigned to committees.

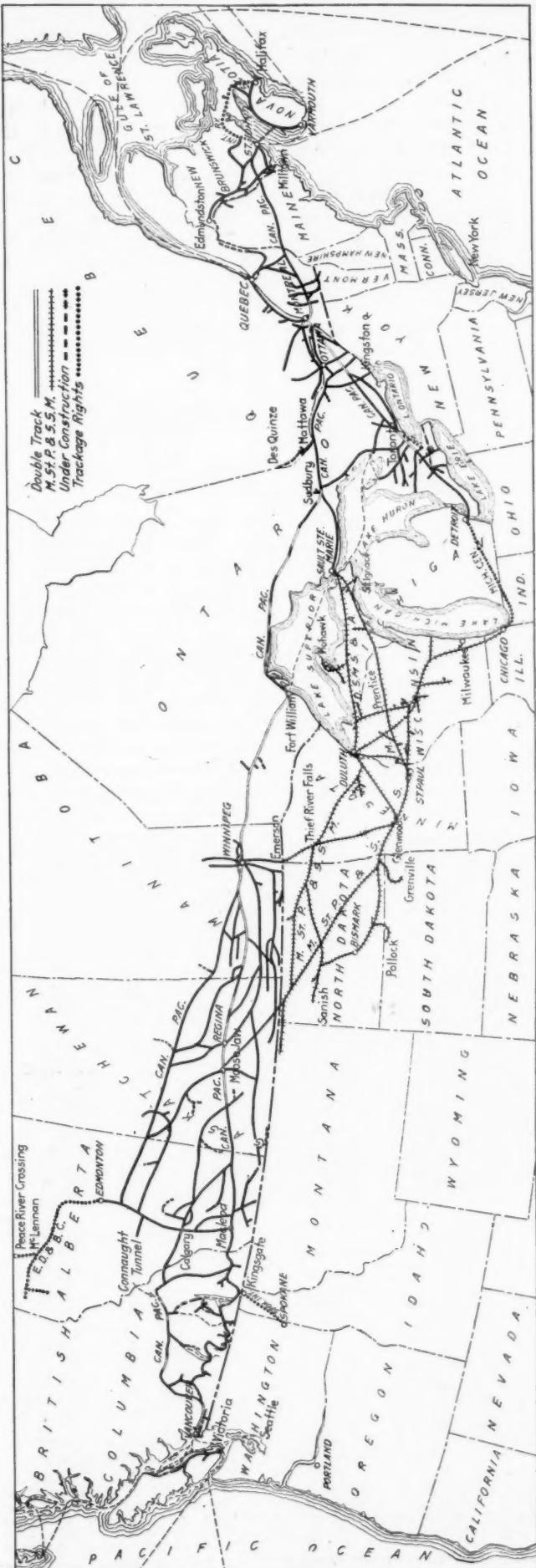
The development of means whereby the latent ability and experience of the remainder of the membership can be utilized to the best advantage and to the mutual benefit of the individual members and of the association is now receiving the careful consideration of the Board of Direction. In his address at the annual meeting H. R. Safford, president of the association, suggested the establishment of "corresponding members" of committees as one means to this end. This plan has much to commend it, especially when applied to those who are so situated geographically or for other reasons as to make attendance at committee meetings difficult or impracticable. The affiliation of such members with committees would enable them to participate to a considerable measure in the work of these committees and would place at the service of these committees the ideas and information possessed by those who are otherwise unable to share in the work. Such memberships would not only distribute the benefits of the organization among a larger number of members, but would also bring to the committees and through them to the association and to the railway industry, much information which is not now made available.

While this plan has been put forth only as a suggestion, it would seem to offer an excellent means of distributing the work of the association among a larger number of members. While the plan would undoubtedly add materially to the burden of correspondence falling on the chairmen of the committees, this is a detail which can undoubtedly be worked out satisfactorily.

Canadian Pacific

MORALE is a rather intangible element, but it is one of the most important elements in any enterprise, business or any other kind. We heard a great deal about morale during the war, and the military officer and layman alike were made to realize that an army could not be successful in its campaigns unless its morale was of the highest order. There may have been those who thought during the war period that possibly the use of the word "morale" was a fad. That, however, is not the case. James Ford Rhodes, in his standard work, entitled "History of the United States from 1850 to 1877," published several years ago, covers the story of the Civil War. His descriptions of the campaigns and of the battles are very detailed, but in the treatment of every campaign he is careful to analyze the morale of the contending armies and to show the importance of the conditions affecting good or poor morale and of the effects of either the one or the other.

Good morale is important in any organization; it is particularly important in a large organization such as an army. A railroad is a large organization; it differs from an army in that its forces are spread over a wide territory, whereas an army is more compact. It has now become generally recognized that morale on a railroad is just as important as it is in an army. The question might arise as to why the importance of morale on a railway has not been so well realized and given as much attention in the past as in the case of an army. The reason probably is that the morale of the forces on a railway has been more or less taken for granted. There is no doubt that under the influences accompanying Federal control, the high morale on the railways of this country was lost. It has required the lack of proper morale to emphasize how important that element is to successful railway operation. The railway executives, since the return of their lines to their own control, have made every



effort to restore the morale of the men employed on their lines. Against the adverse conditions, some have succeeded in greater measure than others, but all realize that morale is of the greatest importance.

The Canadian Pacific was operated throughout the war period as an independent self-controlled property. It was not subjected to those influences which we in this country are now inclined to regard as included among the accompaniments of Federal control. It is not now confronted with those problems which the railroads of the United States are having to meet, relative to the return of their lines to private control. There is no gainsaying that the morale of the forces of the Canadian Pacific was not lessened as it undoubtedly was in this country. Rather the huge task confronting the Dominion during the Great World War served to strengthen the morale on Canada's leading railway rather than to weaken it. The annual report of the Canadian Pacific for 1920 is a story of how that company took advantage of the high grade morale of its organization. It shows how the company was able, despite adverse conditions, to make what under ordinary conditions would have been an extraordinary showing. The showing is all the more remarkable in the comparison with the roads in the United States, many of which have properties equally as good; organizations equally as efficient, which are also conservatively financed, but which throughout much of 1920 lacked that one element which the Canadian Pacific was able to count on so strongly—the morale of its employees.

In its annual report the Canadian Pacific makes a plain distinction between the earnings from railway operation and those from ocean steamship lines, telegraph, etc. The gross earnings from railway operations in 1920 were \$216,641,349, as compared with \$176,929,060 in 1919. Its railway net earnings in 1920 were \$33,153,045, as against \$32,933,036 in 1919, despite the fact that working expenses in 1920 were charged with income taxes which were not payable in 1919 and years immediately prior thereto because of the existence in those years of a special tax on surplus after the payment of dividends. The operating ratio was 84.70; in 1919, 81.39 per cent. Fixed charges in 1920 were \$10,775,409, as compared with \$10,161,510 in 1919. The railroad income available for dividends in 1920 was \$21,877,636, and in 1919 \$22,271,527. The usual dividends of 4 per cent were paid on the preference stock and 7 per cent on the ordinary stock. The net surplus was \$450,359. The surplus in 1919 was \$844,250, but this amount was held in reserve for the special taxes imposed by the government which are referred to above.

The dividends on Canadian Pacific ordinary or common shares are 10 per cent annually. On this 7 per cent is paid from railway earnings, as noted heretofore. The other 3 per cent is paid from what is known as special income wherein are included the net revenue from investments, interest and dividends on securities, net earnings of the ocean and coastal steamship lines, telegraph, etc. This special income account on December 31, 1920, after the inclusion of the items mentioned and the deduction of the 3 per cent dividend, stood at \$20,530,292; on December 31, 1919, the balance was \$17,363,844. The net earnings from the steamship lines were not as great in 1920 as in 1919, but the several other items showed a considerable increase in 1920 over 1919.

The operation of the railway, we have noted, showed a net surplus after the payment of the preference or preferred dividends and 7 per cent on the ordinary shares of \$450,359 as compared with \$844,250 in 1919, the latter total, however, being subject to special government taxes. In view of the trend of earnings in 1920 on most of the railways in the United States, this showing of the Canadian Pacific is nothing short of remarkable. The Canadian Pacific has a great property; it is well organized and efficiently man-

aged; it is conservatively financed and, as has been noted, the morale of its forces is of the highest. That it succeeded in deriving the advantages of all these things in 1920 is evident.

There is no intention in this review to lead the reader to think that the Canadian Pacific was not without its problems in 1920. These problems are included in higher wages; high fuel costs, in high costs of materials and in addition another factor which does not confront railroads in the United States, the matter of exchange. President E. W. Beatty, in his annual report to the stockholders, estimates that the wage increases in May added about \$12,000,000 to expenses during the year and the exchange situation about \$4,000,000.

The wage increases in Canada were effective May 1 as in the United States. In Canada the increase is known as the Chicago Wage Award, in somewhat the same fashion as the name McAdoo scale is used in reference to the increases made during the period of the Railroad Administration. The application of the scales established by the United States Railway Labor Board to Canada was, of course, a natural step, although not the least of the reasons may be said to lie in the fact that of the international railway organizations, about 92 per cent of the membership is in the United States and 8 per cent in Canada. Although the Canadian roads had to accept the so-called McAdoo scale, they did not have to accept the national agreements. These particular deterrents to efficiency of the railway crafts have not applied in Canada. Similarly the Canadian Pacific was not affected by the outlaw strikes of the spring of 1920, except insofar as may have concerned traffic interchanged with connections.

The cost of fuel affected the Canadian Pacific in much the same way as it did many of the roads in the United States, namely in the form of higher prices for coal, increased transportation charges and poor quality. The Canadian Pacific receives coal from British Columbia and from mines in Pennsylvania and other fields. Some of this coal cost in 1920 as high as \$10.50 a ton.

The matter of freight rates came up in Canada just as it did in the United States. The increase in Canada became effective September 13. It was, speaking generally, 40 per cent in eastern Canada and 35 per cent in the west, although with the provision that on January 1, 1921, these increases would be reduced to 35 and 30 per cent respectively. The increases were based principally on what the Canadian Pacific would need to pay fixed charges and dividends. The Canadian Pacific suffered a falling off in its traffic but the decline did not come until about December 15. The increased rates were thus sufficient to enable the company to absorb the increased expenses and with the road's efficient management to enable it to earn a surplus for the year's operations. President Beatty in his report puts it in this fashion: "While, for the reasons mentioned, the net earnings are not commensurate with the volume of business transacted, still in the opinion of your directors, the year's operations must be regarded as satisfactory and compare most favorably with those of any other system on the American continent."

The total freight revenue of the Canadian Pacific in 1920 was \$145,303,400 as compared with \$111,064,442 in 1919. The total tons carried were 30,160,134 as compared with 25,102,821 in 1919. The revenue ton-mileage in 1920, totaling 13,856,607,551, represented an increase of 26.81 per cent over 1919. The average revenue per ton-mile in 1920 was 1.038 cents; in 1919, 1.003 cents. The average revenue train load in 1920 was 599 tons, an increase of 6.82 per cent over 1919. The average number of revenue tons per loaded car mile in 1920 was 26.54.

The total revenue from passengers in 1920 was \$49,-

125,739 and from sleeping cars, express, etc., \$20,713,980, as compared with \$46,182,151 and \$18,199,135 respectively in 1919. The total number of passengers carried in 1920—namely, 16,769,555—represented an increase of 7.01 per cent over 1919. The total of passengers carried one mile, however, represented a decrease of 2.58 per cent. The average journey per passenger in 1920 was 102.45 miles; in 1919, 112.53 miles. The revenue per passenger mile in 1920 was 2.82 cents; and in 1919, 2.59 cents.

Before referring to the matter of finances, attention should be drawn to an interesting table in the report showing where the stock of the Canadian Pacific is owned. The shares are rather widely distributed in comparatively small holdings. Of the total ordinary shares 47.8 per cent are held in the United Kingdom, 17.73 in Canada and 24.10 in the United States. The table shows ownership of common shares as follows:

	Shares	Percentages
United Kingdom	1,242,837	47.80
Canada	460,838	17.73
United States	626,510	24.10
France	79,123	3.04
Other holdings	190,692	7.33
	2,600,000	

President Beatty in his report has considerable to say concerning possible new financing. The amount of unissued consolidated debenture stock authorized but not issued is \$36,000,000 and issued but not disposed of \$32,000,000, a total of \$68,000,000. "The capitalization of the company," he says "is conservative and even low, and this has been accomplished largely through the utilization of surpluses in betterments and improvements which would normally have been paid for out of the proceeds of capital issues. While capital expenditures for the immediate future will be curtailed and the resumption of work requiring large amounts of money will be deferred until a decided improvement in business conditions furnishes warrant for incurring them, your directors consider that it will be desirable that a portion of the cash reserves expended on capital account should be restored within a short time and, to this end, in order to supplement and extend the powers of the company to issue forms of securities other than those it is already empowered to issue and which are more appropriate to present market conditions, have made application for an amendment to the company's charter permitting the issuance of bonds, debenture or other securities, collateral to or in lieu of any consolidated debenture stock which the company is or may hereafter be empowered to issue and for the same amount, such securities to be payable in such currency at such times and places, and bearing such interest as your directors may think proper. * * * The annual meeting will be made special for the purpose of authorizing, if approved, the issuance of such securities."

The following table shows the earnings of the Canadian Pacific in 1920 as compared with 1919:

	1920	1919
Mileage operated	13,402	13,389
Freight revenue	\$145,303,400	\$111,064,442
Passenger revenue	49,125,739	46,182,151
Total operating revenue	216,641,349	176,929,060
Maintenance of way expenses	32,573,927	28,912,220
Maintenance of equipment	46,350,793	33,897,728
Traffic expenses	4,999,345	3,829,687
Transportation expenses	86,608,511	68,054,175
General expenses (inc. taxes)	8,969,996	6,105,783
Total operating expenses	183,488,305	143,996,024
Net operating income	33,153,045	32,933,036
Fixed charges	10,775,409	10,161,510
*Railroad income available for dividends	21,877,636	22,271,527
Special income	10,966,448	9,049,343
Total income	32,844,083	31,320,869
Transferred dividends (4 per cent)	3,227,277	3,227,277
Common dividends (10 per cent)	26,000,000	26,000,000
Surplus from all operations	3,616,806	2,093,593

*The 4 per cent dividend on preference stock and 7 of the 10 per cent dividends on the ordinary stock are paid from this amount and the remaining 3 per cent on the ordinary shares from special income. Deduction of preferred dividends and 7 per cent common dividends left net surplus in 1920 of \$450,359 and in 1919, \$844,250, the latter amount, however, being placed in reserve for special taxes.



A Typical Layout of a Roundhouse and Small Shop

Modern Engine Terminals and Repair Shops*

The Results Contributed to Successful Operation by Proper Design
of Terminal Buildings

By H. E. Stitt

Chief Engineer, The Austin Company, Cleveland, Ohio

MANY PAPERS prepared heretofore on Modern Engine Terminals and Repair Shops have dealt primarily with the general layout of the terminals. In so doing, the results contributed to the successful operation of railway terminals by proper design of terminal buildings has been rather briefly disposed of. Too much stress and emphasis cannot be attached to the important role the buildings play in this field. They are not simply shelters, but they, them-

For this reason considerable thought and attention have been given to the development, design and construction of modern terminal buildings.

A further fact complicates the situation in that it is very difficult to add modern facilities to an existing plant which is designed and constructed without the contemplation of such added facilities. This is true, very often, because the plant has become surrounded by the city in which it is located. This makes reasonable priced land frequently unavailable for building additional units. Also, it is impossible to install crane runways and other labor saving devices in existing buildings, due to lack of clearance and insufficient strength in the existing structures.

Assuming, therefore, that the railway executive is more conversant with the facilities required for his terminals and admitting that the location and layout of each terminal is a separate, individual problem in each case—what is there, then, to influence the design of the terminal more than the major features of the terminal buildings? The major design of course must be followed up by the detail design. The design which is not based on modern practice should be superseded.

Development of Modern Terminal Buildings

The older types of terminal buildings of all classifications, including engine houses and repair shops, almost without exception have been—as considered in contrast with the modern terminal buildings—low, poorly lighted and ventilated, devoid of proper sanitary facilities, rest rooms, artificial lighting and heating. The advent of the overhead, electric traveling crane, as well as the modern smoke exhausting devices and other such improvements, have thrown many of the older type buildings into the obsolete class.

Other changes such as the substitution of structural steel and reinforced concrete for timber, the substitution of concrete for rubble masonry or brickwork, the substitution of steel sash for wood sash, and many other well-known changes have had a marked effect in bringing about a striking contrast between the old and new terminal buildings.

(At this point Mr. Stitt called attention to a number of articles dealing with locomotive terminals and shops that have



A Modern Erecting Shop Served by Light and Heavy Cranes and Transfer Table

selves, are appliances in that they support labor saving devices.

One of the prime requisites of the up-to-date terminal is to have modern terminal buildings, or in other words, the character of the terminal buildings determines, to a very large extent, not only the present facilities at a terminal, but also in a considerable measure the facilities it is possible to add to an existing terminal.

Because of the many classes and sizes of terminals and the many uses to which these buildings are put, it is impossible to determine on a type which is suitable for all conditions.

*From a paper presented before the Central Railway Club, March 10, 1921.

appeared recently. He supplemented his paper with comments from some of these and quoted at some length from the article entitled "Are Modern Locomotives Efficiently Used?" which was published in the *Railway Age* of February 27, 1921.)

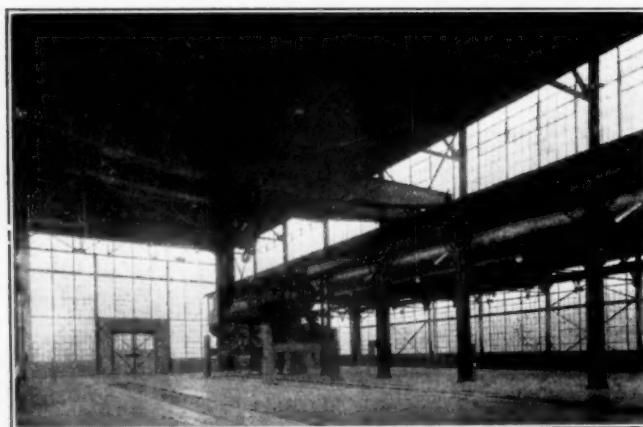
Design of Modern Railway Terminal Buildings

The function of engine terminals has been ably defined as a means to provide adequate facilities for the proper maintenance and repairs of locomotives and current routine operations as inspecting, cleaning, coaling, sanding, washing within the shortest possible time. Any factor, therefore, that will minimize this time is well worth our consideration. The human element as well as the mechanical element works to better advantage under proper environment and treatment.

The proper design of railway terminal buildings usually suggests itself after due consideration has been given to the facilities required for the terminal in question. By this I mean the work to be performed rather than the equipment required. In this regard the operating executive is surely most conversant with the requirements. This is true in general industrial work as well as in the railway field. Our observation indicates the railway executive needs support in determining the equipment and the general and detail design of the buildings on account of their intimate relations with the equipment to be installed.

It has been said in one of the articles quoted that "The author has purposely omitted reference to detail construction of buildings as these features generally conform to the railroads' standard practice." This is naturally applicable only to railroads having enough new construction under way to enable them to keep their standards up-to-date; likewise to enable them to maintain an organization of the proper experience and training as well as adequate capacity for this work.

If the railroad has not had the recent new construction work their engineering organization is not enabled to keep



A Small Shop with Light Crane and Unwheeling Hoist

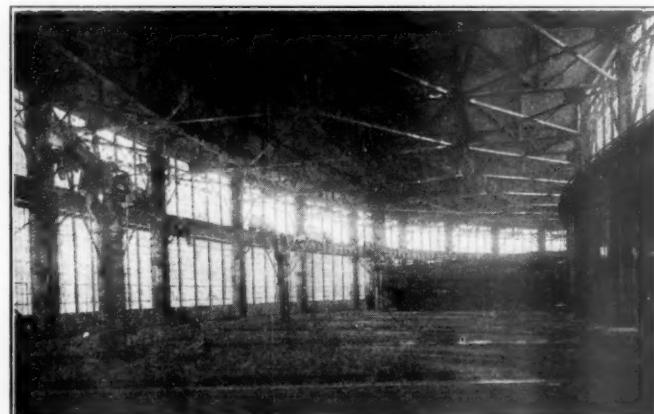
step with the development in latest designing and construction methods. This has to do with railroads equally as well as it has to do with general industrial organizations.

The next step in the design is a careful review of the facilities required, as set up by the railway executive most conversant with the conditions involved. This review taken into consideration with the importance of the terminal and the work to be accomplished there, points its way naturally to the facilities which should be provided.

A common error, made in all kinds of designing work, is in the ignoring of the financial resources of the owner by the engineer. This practice frequently leads to the preparation of elaborate, expensive designs, entirely unsuited to the situa-

tion. Then, when estimates are prepared, the mistake is realized and the work either postponed, due to lack of available funds, or considerable time and money are lost in the preparation of revised designs.

To properly make designs for railway terminal buildings, it is necessary that the designer have a working knowledge of railway requirements, as well as being familiar with modern terminal construction. As a matter of fact, it requires an engineering corps to do this work properly. In such a corps the men will have had experience covering different operations of the design. For instance, one man may be an expert on layout, another man an expert on structural design, while still another man or group of men will be experts on the



Roundhouse with Down-Draft System and Traveling Crane Spanning the Engine Bay

trades involved by the mechanical and electrical equipment. By adhering to these principles, together with the added advantage of close co-operation with the railway executive, who defines the needs and requirements for the particular problem in hand, there is a definite plan of action provided.

The modern railway terminal building should be the result of close observation in determining the needs of railway men. As a consequence certain types of construction have been generally accepted and those most commonly used have been more or less standardized. Standardization should be used only where standard buildings or equipment meet the necessary requirements.

If a provision in the layout of the buildings for a railway terminal will permit of more than one arrangement for future expansion, it generally results to advantage to use such a design. Regardless of how sure you are that your future development will be along certain lines, it has become a matter of note that there will be some changed conditions interposed before the future extension is built. For instance, the passage of the Adamson Law imposed entirely new conditions which determined the desirable locations of railway terminals.

Believing that a table, or schedule, of the options that arise in designing terminal buildings would meet with a favorable reception, the writer has prepared the tabulated schedule given below:

Suggested Schedule for Engine House Design

I. CAPACITY OF HOUSE:

- A. Approximate number of locomotives per day, at present.
- B. Approximate number of locomotives per day, ultimately.
- C. Suggested number of stalls for the present.
- D. Suggested number of stalls for ultimate capacity.

II. TYPES OF BUILDINGS:

- A. Roundhouse.
 - (a) Single turn-table installation.
 - (b) Twin turn-table installation.
- B. Longitudinal House.
- C. Transverse House.

- III. SPECIFY NUMBER, WIDTH, AND ARRANGEMENT OF SECTIONS.
- IV. DETERMINE TYPE OF ROOF ARRANGEMENT.
- V. MECHANICAL EQUIPMENT TO BE PROVIDED INSIDE THE HOUSE:
 - A. Electric Overhead Traveling Crane.
 - B. Hoisting Jacks.
 - C. Jib Cranes.
 - D. Number of Drop Pits.
 - E. Mechanically Operated Down Draft Smoke Exhaust System.
 - F. Heating Plant.
 - (a) Blower system with underground ducts.
 - (b) Blower system with overhead ducts.
 - (c) Integral fan blowing unit—steam heated.
 - (d) Integral fan blowing unit—direct fired.
 - (e) Direct radiation. Not commonly used in modern terminal buildings.
 - G. Electric Lighting.
 - H. Plumbing.
 - I. Sprinkler System.
- VI. MECHANICAL EQUIPMENT TO BE PROVIDED OUTSIDE THE HOUSE:
 - A. Turn-Table.
 - (a) Deck Girder Type.
 - (b) Through Girder Type.
 - B. Transfer Table.
 - C. Water Conditioning Plant.
- VII. KINDS OF CONSTRUCTION:
 - A. Fire Proof.
 - (a) Steel encased in concrete.
 - (b) Reinforced concrete structure with hollow tile and concrete joist roof construction.
 - (c) Reinforced concrete structure with so-called tin pan concrete joist roof construction.
 - (d) Reinforced concrete structure with concrete slab roof construction.
 - (e) Brick side walls—steel sash.
 - B. Non-Combustible.
 - (a) Exposed steel structure with non-combustible roof.
 - (b) Brick side walls—steel sash.
 - C. Slow-Burning.
 - (a) Steel structure—heavy timber roof framing and plank roof decking.
 - (b) Heavy timber structure and plank roof decking.
 - (c) Brick side walls—steel sash.
 - D. Inflammable. (Practically obsolete as applied to new structures.)
 - (a) Heavy timber structure with small dimensioned timber roof framing and decking.
 - (b) Small dimensioned timber side walls and wood sash.
 - E. Floors.
- VIII. REPAIR FACILITIES TO BE PROVIDED:
 - A. Heavy and Light Machine Shop.
 - B. Light Machine Shop Only.
 - C. Blacksmith Shop.
 - D. Engine Room.
 - E. Boiler Room.
 - F. Pump Room.
 - G. Pipe Tunnels.
 - H. Boiler Washing Plant.
 - I. Tool and Storeroom.
 - J. Offices.
 - K. Toilet and Locker Rooms.
 - L. Oil House.
 - M. Water Tank.
 - N. Coal, Coke and Iron Storage.
 - O. Light, or Running Repair Shop.
- IX. TYPE OF SMOKE JACK FOR NATURAL VENTILATION:

Schedule for the Design of a Modern Locomotive Repair Shop

- I. CAPACITY OF PITS:
 - A. Approximate number of locomotives per day, at present.
 - B. Approximate number of locomotives per day, ultimately.
 - C. Suggested number of pits for the present.
 - D. Suggested number of pits for ultimate capacity.
- II. TYPES OF BUILDINGS:
 - A. Longitudinal.
 - B. Transverse.
- III. SPECIFY NUMBER, WIDTH AND ARRANGEMENT OF SECTIONS:
- IV. TYPE OF ROOF ARRANGEMENT:
 - A. Flat Roof with Monitor.
 - B. Sloping Roof with Monitor.
 - C. Aiken, or Depressed Bay, Roof.
- V. MECHANICAL EQUIPMENT TO BE PROVIDED INSIDE THE SHOP:
 - A. Electric Overhead Traveling Crane.
 - (a) Light crane runway—for handling locomotive parts.
 - (b) Heavy crane runway—for lifting locomotives.
 - B. Hoisting Jacks.
 - C. Heating Plant.
 - (a) Blower system with underground ducts.
 - (b) Blower system with overhead ducts.
 - (c) Integral fan blowing unit—steam heated.
 - (d) Integral fan blowing unit—direct fired.
 - (e) Direct radiation—not commonly used in modern terminal buildings.
 - D. Electric Lighting.
 - E. Plumbing.
 - F. Sprinkler System.

- VI. MECHANICAL EQUIPMENT TO BE PROVIDED OUTSIDE THE SHOP:
 - A. Transfer Table.
 - B. Water Conditioning Plant.
- VII. KINDS OF CONSTRUCTION:
 - (Same as given above for engine house)
- VIII. REPAIR FACILITIES TO BE PROVIDED:
 - A. Heavy and Light Machine Shop.
 - B. Light Machine Shop Only.
 - C. Boiler Shop.
 - D. Truck Shop.
 - E. Blacksmith Shop.
 - F. Separate Boiler, Engine and Pump House.
 - G. Lye Vats.
 - H. Paint Shop.
 - I. Oil House.
 - J. Tool Room.
 - K. Storehouse.
 - L. Water Tank.
 - M. Pipe Tunnels.
 - N. Scrap Platform.
 - O. Ash Pit.
 - P. Coal Storage.
 - Q. Offices.
 - R. Toilet and Locker Rooms.
 - S. Coal, Coke and Iron Storage.
 - T. Reclamation Plant.
 - U. Foundry.

Schedule for the Design of a Modern Car Repair Shop

- I. CAPACITY OF HOUSE:
 - A. Approximate number of cars for heavy repairs per day, at present.
 - B. Approximate number of cars for heavy repairs per day, ultimately.
 - C. Approximate number of cars for light or running repairs per day, at present.
 - D. Approximate number of cars for light or running repairs per day, ultimately.
 - E. Suggested number of tracks—for the present.
 - F. Suggested number of tracks for ultimate capacity.
 - G. Suggested number of pits for the present.
 - H. Suggested number of pits for ultimate capacity.
- II. TYPES OF BUILDINGS:
 - A. Longitudinal House.
 - B. Transverse House.
- III. MECHANICAL EQUIPMENT TO BE PROVIDED INSIDE THE HOUSE:
 - A. Electric Overhead Traveling Cranes.
 - B. Jacks for straightening steel car frames.
 - C. Heating Plant.
 - (a) Blower system with underground ducts.
 - (b) Blower system with overhead ducts.
 - (c) Integral fan blowing unit—steam heated.
 - (d) Integral fan blowing unit—direct fired.
 - (e) Direct radiation—not commonly used in modern terminal buildings.
 - D. Electric Lighting.
 - E. Sprinkler System.
- IV. MECHANICAL EQUIPMENT TO BE PROVIDED OUTSIDE THE HOUSE:
 - A. Transfer Table.
- V. KINDS OF CONSTRUCTION:
 - (Same as given above for engine house)
- VI. REPAIR FACILITIES TO BE PROVIDED:
 - A. Wooden Car Shop.
 - B. Steel Car Shop.
 - C. Riveting Shop.
 - D. Blacksmith Shop.
 - E. Wheel Shop.
 - F. Separate Boiler and Engine House.
 - G. Paint Shop.
 - H. Woodworking Platform.
 - I. Scrap Platform.
 - J. Miscellaneous Platforms.
 - K. Depressed Track.
 - L. Service Building.
 - M. Track Scale and Scale House.
 - N. Toilet and Locker Room.
 - O. Coal Storage.
 - P. Shop Yards.
 - Q. Light Car Repair Yard.

Schedule for the Design of a Modern Separate Boiler and Engine House

- I. GENERAL CHARACTER OF PLANT:
 - A. Plant consisting of boilers and engine room with steam driven electrical generators and motor-driven air compressors.
 - NOTE: This type of plant is required when all electric power is generated at the terminal.
 - B. Plant consisting of boiler house and engine room with steam driven air compressors and electric power furnished from central station.
 - C. Plant consisting of boiler house only—where electric power is furnished from central station.
- II. LEVEL AND ELEVATED TYPES:
 - (a) Boiler room floor at elevation of surrounding grade or ground line.
 - (b) Boiler room floor elevated so that ash hopper floor is at elevation of surrounding grade or ground line.

- III. SPECIFY NUMBER, WIDTH AND ARRANGEMENT OF SECTIONS:
 IV. DETERMINE TYPE OF ROOF ARRANGEMENT:
 V. EQUIPMENT TO BE PROVIDED INSIDE THE BOILER HOUSE:
 A. Boiler Horsepower Required.
 B. Type of Boilers and Number of Units.
 C. Arrangement of Batteries.
 D. Type of Furnace.
 (a) Mechanical stokers.
 (b) Hand fired.
 E. Type of Natural Draft Stokers.
 (a) Chain grade.
 (b) Over-feed.
 F. Type of Forced-draft Stoker.
 (a) Under-feed.
 G. Coal bunkers.
 (a) Steel.
 (b) Concrete.
 H. Type of Coal Conveyor.
 I. Ash Handling Equipment.
- VI. EQUIPMENT TO BE PROVIDED INSIDE ENGINE HOUSE:
 A. Generator driven by reciprocating engine.
 B. Generator driven by steam turbine.
 C. Condensers.
 D. Air Compressors.
 (a) Steam driven.
 (b) Motor driven.
 Note: Specify cubic feet of air required per minute.
- VII. EQUIPMENT TO BE PROVIDED OUTSIDE BOILER HOUSE:
 A. Stack.
 (a) Brick.
 (b) Steel.
 B. Ash Loading Equipment.
- VIII. KINDS OF CONSTRUCTION:
 (Same as given above for engine house.)

SUBJECT: AUXILIARY BUILDINGS FOR MODERN RAILWAY TERMINALS

The arrangement and character of construction for auxiliaries for the modern railway terminal should be determined by the general decisions determined upon for the design of the principal buildings at the terminal.

For instance, if it has been determined to build a terminal at a certain location, the more tentative assumptions which can be made before the general proportions of the building are determined and the general layout of the terminal is drawn up, the more expeditiously can the designing work and estimating work be prosecuted. Certainly, you cannot make a general layout for a terminal without knowing what buildings you contemplate erecting there and approximately the size and character of the buildings.

For this reason, then, early decisions relative to the design and character of the buildings becomes paramount. Right here let us note that where there is a lack of such decisions being made by executives, there results improper designs, lost motion in general, increased cost of designing and estimating and other numerous difficulties. Where the executive himself does not make the decision, certain assumptions have to be made by his subordinates. These subordinates make their assumptions to the best of their ability, taking into consideration the information they have at hand. Naturally, they do not have access to the resources of the company to the same degree that is available to the executive.

Assuming this occurs and the designs approved, and the estimates prepared, it may then be realized that the design is not sufficiently economical to promote the best interests of the company. In such cases, a new design may be called for; in other cases, the building might have to be constructed and a fixed charge incurred which is not warranted by the resources and the policies of the company.

If the executive who is primarily responsible for the determination of the design and the construction which is to be used in the terminal buildings will use this, or a similar schedule, we believe this procedure will be found of value.

In preparing the schedule it has been borne in mind that such a list should cover the needs and requirements of small railroads as well as large railroads, and railroads whose resources and earning capacities are limited, as well as the railroads which have unlimited resources and a well sustained earning capacity due to location, affiliations, etc.

It of course goes without saying that the schedule after having been properly developed should be given to the parties responsible for the layout of the terminal and for the design of the terminal buildings, as well as for the complete estimate.

Wheel Burning Injures Rail

THE BUREAU OF SAFETY of the Interstate Commerce Commission has issued a report covering the investigation of a derailment of a Baltimore & Ohio passenger train at Glenwood, W. Va., on December 11, 1919, which was caused by the breaking of a rail which showed evidence of having been wheel burned. The train involved in the accident consisted of nine cars and was pulled by two engines. The accident happened at the station at Glenwood on the Kenova-Parkersburg line, while the train was traveling at a speed shown by a speed recorder to have been between 42 and 43 miles per hour. The track at this point was laid with 75-lb. rails supported on an average of 18 ties per 33-ft. rail.

This report is summarized as follows: The wheel burning of rails, in some degree, is a matter of common occurrence in many places in the track. Rails in this condition abound in yards, freight terminals, and in the vicinity of signal towers and stations. Few, if any, of these localities are free from examples of rails which are thus affected.

The derailment in question was due to the failure of a rail which broke at several places along its length, exhibiting incipient cracks in the head. Investigation by James E. Howard, engineer-physicist of the commission, showed these cracks to have had a thermal origin. That is, this was a wheel-burnt rail, although its appearance in the track was not suggestive of such action having taken place. There was a series of fine crosswise cracks visible on the running surface of the head near the gage side, but the usual evidence of wheel burning, a roughened, abraded surface, was not shown.

Sections of the rail were pickled in hot hydrochloric acid. This exposure and the microscopic examination conducted each revealed the effects of wheel burning. The rail had been exposed superficially to a high temperature and hardening had resulted therefrom. Incipient cracks were developed in the thin layer of hardened steel, some of which had penetrated the normal metal of the rail. These incipient cracks greatly weakened the rail and led to its premature failure. This type of wheel burning is one of peculiar danger.

The series of short crosswise cracks was not conspicuously shown. They were noticeable, however, because they did not present the usual characteristics of flow of metal under wheel pressures. Their full significance now appears in the results of the investigation of the rail. They stand as warning indications of the seriousness of their presence.

In cases of wheel burning, profound changes take place in the structural state of the steel, changes which take place within extremely narrow limits. Rapid transition from one phase to another so narrowly confined may in itself intensify the internal destructive forces. Special tests were made to illustrate the phases in detail which the hardened zones experience, the results of which are embodied herein. The destructive influences which prevail are clearly shown, and they constitute elements of danger in the track.

The prevention of wheel burning in its entirety presents great practical difficulties. Efforts should be directed toward minimizing these destructive influences. The presence of incipient cracks as they were displayed by this rail is evidence of impaired strength and constitutes a warning signal that a dangerous state has been reached.

ACCORDING TO A RECENT ARTICLE in the Gazette (Montreal), a movement is on foot in Canada for the establishment of a corporation for the financing of foreign trade similar to organizations in the United States under the Edge law. The proposed corporation would have a capitalization of \$25,000,000, its resources to be derived principally from the sale of debentures to the amount of four times its capital.

3

Preventing Thieving and Pilfering on the Railroads

Organized Efforts Necessary to Combat Effectively This Heavy Drain on Revenues

By Alexander S. Lyman

General Attorney, New York Central, New York City

THE WAVE OF MORAL DEGENERACY which has swept over the world in the wake of the great war, finds an all too familiar expression in crimes against property, notably in the perpetration of frauds, thefts and robberies. The condition is a general one, but the railroads have felt it with peculiar force. A large proportion of the property taken from their custody is difficult of identification, or its markings can be destroyed. In consequence nearly all of it is susceptible of ready sale at good prices.

The wage-earning classes on railroads, as elsewhere, have been selected especially as the target for bolshevist teachings under one or another guise. Much of this propaganda has as its primary object the inculcating of a contempt for the institution of private property and for the right of individuals to possess private property. These surreptitious teachings have been effective with many in the ranks of wage-earners with the result that, if not actually dishonest themselves, many railroad employees are indifferent to the depredations and frauds of others.

Another influence stimulating crime is the reluctance of judges exercising criminal jurisdiction, to impose substantial sentences upon persons convicted before them of theft. This may be due in some instances to the belief on the part of many judges that our penal institutions are merely schools for crime and moral profligacy, and that to send a young man to one of these institutions is simply to assign him forever to the ranks of the criminal classes. Again, it may happen that the judges are persuaded to leniency by political or personal influence. Too often corruption is found among members of the railroad police forces themselves, and all too frequently thefts are committed in collusion with railroad police, the local municipal police and railroad employees. Many wholesale robberies have been perpetrated under circumstances indicating a detailed conspiracy between railroad employees who are in a position to know of the arrival of large and valuable shipments at a given terminal, and well organized gangs of thieves. Last but among the most important of the malefactors, are the receivers of stolen property, men of large means who stand behind the thieves, maintain elaborate machinery for spiriting away and disposing of stolen property, and who supply any amount of unimpeachable bail when the thieves are arrested. These men even provide the services of experienced criminal lawyers.

It frequently happens, too, that the railroads or the shippers are victimized by frauds practiced on or by shipping and delivery clerks, or arising from the careless or inefficient performance of their duties.

While pilfering, or thievery on a petty scale, has been prevalent for many years and perhaps will never be wholly suppressed, the present losses are so appalling that the carriers must realize that a new situation has arisen, presenting new problems which cannot be solved satisfactorily by merely pursuing the old lines of defense. When the freight loss and damage account presents an aggregate which may mean the difference between a thin or a fat dividend on the capital stock, the managements must realize that they are confronted with one of the most serious problems in modern railroading.

Properly detailed statistics compiled by the freight claim

department should show where the weak spots are, that is, where the greatest number and the most serious depredations occur. It will be found that these are the larger cities where there are numerous railroad terminals. Experience has shown that if a particular carrier in one of these centers has an unusually effective police department, and especially if it has provided itself with criminal counsel of energy and experience in aiding the prosecution and conviction of those caught stealing property in its custody, this carrier will have comparative immunity, while the thieves concentrate their efforts on other less well fortified roads.

The obvious method of reaching this situation is through a joint criminal law bureau. This has been tried and is being employed successfully at the present time in St. Louis and in New York City. At the head of such a bureau is placed a lawyer of long criminal experience who is not only thoroughly familiar with criminal procedure from the prosecuting point of view, but who also has extensive acquaintance with the judges who sit in criminal cases and with the prosecuting officers. His qualifications for dealing successfully with thieves will be much enhanced if he also possesses means of securing reliable information from the underworld. The salary and expenses, and the hire of necessary assistants for this lawyer are supplied by the carriers whose lines terminate in a given city, and the proportionate contributions may be readily placed upon an equitable basis. Each carrier, although a party to this agreement, retains the organization and control of its own police force. Each police chief is, however, required to report at once every serious depredation and frequently minor cases, the prosecution of which will have a wholesome effect, to the criminal counsel, who takes immediate personal charge of the more important cases, securing statements and directing investigations. In most instances the thefts are of property transported in interstate commerce so that jurisdiction is conferred upon the Federal courts. One great advantage Federal courts possess over the State courts is that the jurisdiction of the former extends over the entire country so that the attendance of witnesses from remote points can be compelled. On the other hand, the fact that the goods stolen were in interstate transit must be established in order to hold jurisdiction, and this line of proof under the decisions, is frequently of a very technical nature. It follows, therefore, that the accumulation of the necessary proof can usually be secured successfully at the outset only under the guidance of an experienced criminal lawyer. Too frequently the police departments of the carriers, if they attempt to work out this investigation by themselves, fail in some technical but essential particular. Under the guidance of criminal law experts, members of the railway police force show a much greater intelligence and efficiency in handling criminal work in all its stages, and they avoid the errors which otherwise often result in the escape of guilty parties.

The measures described above, effective as they are in coping with ordinary situations, must be added to in handling the present problem. A department of surveillance, organized and conducted by a high type of executive is called for. The chief of this department should report only to the head of the corporation and should have under his charge three co-

ordinating branches, each under a separate command, as follows: (1) A bureau of efficiency, having to do with (a) the selection of men entering the employ of the company, on the score of their previous record for probity, (b) the caliber, habits and conduct of conductors, and of receiving and delivery clerks, (c) the method of receipting for, tallying and checking freight, and the notification of its arrival and delivery to the consignee; (2) a bureau of patrol to guard freight at terminals and in transit, and (3) a detective bureau to investigate and collect evidence against thieves and receivers, and to recover stolen property.

With this type of organization for each carrier, and with means adopted for exchanging information in the larger centers of traffic and for co-operation through joint criminal counsel in the prosecution of frauds and thefts, there would be a reasonable expectation of coping successfully with the problem. The average railroad police department of the present day (with some praiseworthy exceptions) is obsolete and inadequate in personnel, organization, scope and methods.

Roads Continue Wage Reduction Conferences

MANY ROADS are continuing the conferences with employees regarding the matter of wage reductions, although there are few evidences in any quarter that any considerable number of the men are going to accept decreased wages without a decision to that effect by the Labor Board. Several companies, including the New York Central and the St. Louis-Southwestern, have already laid their cases before the board and many other companies will probably follow their example.

The Delaware, Lackawanna & Western will hold conferences on April 5 with certain classes of its skilled labor in the endeavor to come to an agreement regarding wage reductions. The unskilled labor on this road has refused to accept the wage reductions proposed, and the matter will be laid before the Labor Board on April 4.

The management of the Gulf Coast Lines has held conferences with representatives of its unskilled labor and proposed new wage rates ranging from 20 to 25 cents an hour on a 10-hour day basis. The employees did not agree to accept these reductions and the question will be referred to the Labor Board for decision.

Application by certain organized employees for an injunction to prevent four subsidiary companies of the New York Central from reducing wages on April 1 which was filed in Columbus, Ohio, was withdrawn when the company's attorney announced that, pending the Labor Board's decision, the present rates would continue in effect.

The Central of New Jersey held conferences with its unskilled workers on March 24 and with certain classes of skilled employees on March 25. The attitude of the employees was that, while they admitted the necessity of certain reductions in wages, at the same time they were not disposed to accept a decrease unless it was passed upon by the Labor Board. The company is, accordingly, planning to file its petition to that body at an early date.

The Lehigh Valley, following unsuccessful attempts to secure the agreement of their unskilled employees to reductions in rates, has laid the matter before the Labor Board.

As was noted in the *Railway Age* of last week many other roads, including the Pennsylvania, the Philadelphia & Reading, the Erie, the New York, New Haven & Hartford, the Nashville, Chattanooga & St. Louis, and the Central of Georgia are also seeking reductions in the wages of various classes of their employees.

The conferences with the marine workers in New York harbor are being continued but no definite general settlement has as yet been reached.

Court Denies Labor Board's

Jurisdiction in A. B. & A. Case

Judge Samuel H. Sibley in an oral opinion March 25 denied the petition of former employees of the Atlanta, Birmingham & Atlantic, now on a strike, that the receiver be required to take the question of wages to the Labor Board in Chicago. He stated that in some cases the Labor Board might be a better judge of questions of wages than a court would be, but in a case involving, as this case does, the proposition that the wages fixed by the said Labor Board are so high that the railroad cannot pay them and continue to function, the question becomes a judicial one, and therefore entirely proper for the court to decide.

As to the rights of the former employees under the Newlands Act, Judge Sibley held that the Newlands Act was constitutional and affected the court's powers with reference to wages, and that the court ought not to reduce wages of men to whom the act applied without giving them a hearing after 20 days' notice, and that the act applied as he saw it now, only to engineers and train crews.

B. L. Bugg, receiver of the company, announced on March 26 that pursuant to the court's order of the day previous the train and engine men would be paid at the old wage rate for the five days they worked after the reduction order was put into effect.

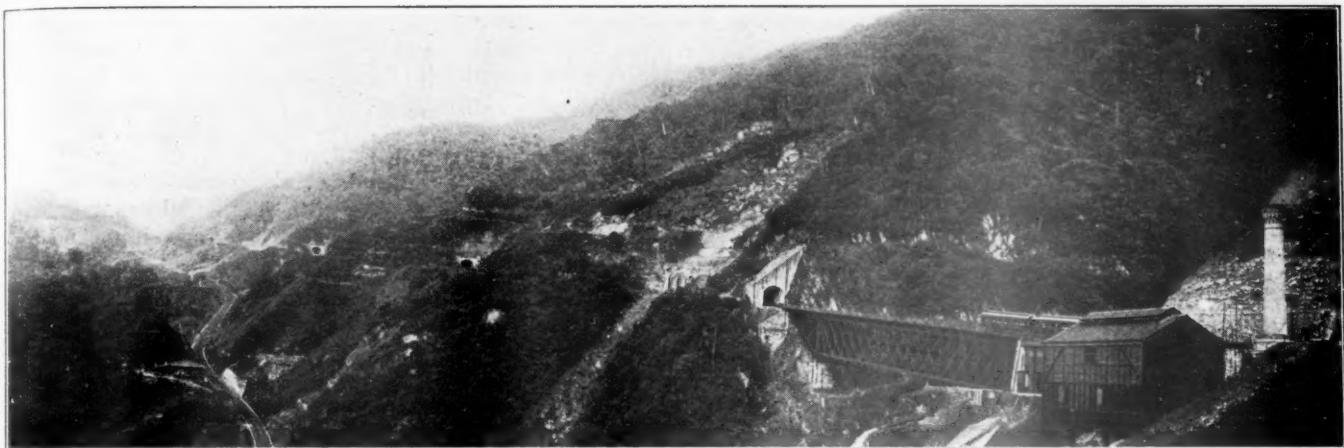
The striking employees withdrew from the wage hearing before Judge Sibley on March 26 when he ruled that the receiver should not discharge 900 men taken on to replace the strikers. Earlier in the session the counsel for the railroad declined to consider a proposal of the employees that they return to work immediately accepting the wage reductions, provided that they be allowed to return to work in a body at their former status and provided that the court should appoint auditors to examine the company's books to ascertain whether or not it was able to pay wages on the old basis.

Regional Boards Question Referred

to Roads in Each Region

On March 24 the standing committee of the Association of Railway Executives heard the report of the conferences which T. DeWitt Cuyler, chairman of the Association, held with the leaders of the train and engine service brotherhoods relative to the question of the advisability of establishing regional boards of adjustment. The committee decided that the question should be submitted to conferences of the individual roads in each region. Accordingly the following men were chosen to arrange for conferences of the railroads in each territory: L. F. Loree, president of the Delaware & Hudson, for eastern territory; W. R. Cole, president of the Nashville, Chattanooga & St. Louis, for southeastern territory; S. M. Felton, president of the Chicago Great Western, for western territory; B. F. Bush, president of the Missouri Pacific, for southwestern territory.

A BOOM is well under way in Mexico. Care, however, must be taken that it does not degenerate into a "crazy" one. The revolution gave Mexico a considerable amount of free—but costly, to speak in paradox—advertising; now that peace has come, every office boy in the United States "knows all about Mexico." The greater part of the "all" is in many respects grotesque. The average American's ignorance of the real Mexico is sublime. The prevailing idea in these United States at the present moment is that one has only to go to Mexico to pick up a fortune; the popular mind must be disabused of this notion if real progress is to be made in the development of the natural resources with which nature has endowed our sister nation.—*N. Y. Commercial*.



Sao Paulo Railway—New Line at Right—Old Line at Left

Brazil as a Market for American Railway Supplies

Thirty Per Cent of Country's Lines Are British—Opportunities
Are with State-owned Railways

By John P. Risque

OME INDICATION of the extent of British railway operations in Brazil was given in the preceding article of this series in which the Sao Paulo Railway was described. Just as English, however, as that road, which has been called the richest railway in Brazil, is the country's longest line, the Leopoldina, which operates approximately 1,800 miles of meter gage line. This road runs from Nictheroy, across the bay from Rio de Janeiro, to Friburgo, Campos, Victoria, Leopoldina and other points in the states of Minas

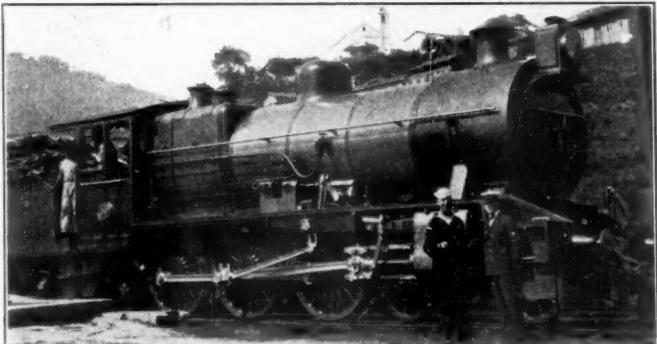
Geraes, Rio de Janeiro and Espirito Santo. Its route follows the Paranhya river for some distance and then strikes out across a series of mountain ranges involving very heavy grades. This company has 220 locomotives, 278 passenger cars and 2,350 freight cars.

be found in the Brazil Northeastern Railway, a 470 mile line, also of meter gage, which runs from the seacoast town of Fortaleza inland through the state of Ceara. It has 41 locomotives, 41 passenger cars and 285 freight cars. The state of Ceara is about the size of Illinois and has a million inhabitants. This railway is one of those which have been leased by the government to private operators and is said to be due to revert to the government in 1970, but, by terms not unfavorable to the operating company, can be returned in 1940.

The fourth British enterprise in the Brazilian railway field is the line with a very pretentious name but a diminutive mileage—the Brazil Great Southern—a meter gage road but 185 miles in length. This railway, which is owned by the Brazilian government, is leased to English operators and runs from a town called Quarahim on the Uruguayan border to another town called Itaqui, on the Argentine border, and forms a connecting link between the northwestern line of Uruguay and the Paraguay Central in that republic, both of which are owned and operated by Britons.

The British railway operations in Brazil reaches some 4,000 miles of line, or 30 per cent of the country's total mileage. It is now proposed to consider for the moment some Brazilian roads which are outside of the English "buy-it-at-home-at-any-price" sphere of influence. There are some railways and projected lines in the country which are now, to a certain extent, patrons of our mills and factories, and which, under the gradual but unmistakable extension of control and operation by a government which is known to be friendly to us, will, it is hoped, in due time, become "steady customers" of our railway supply interests. Before attempting to set down some statements referring to the relative locations, sizes, manner of operation and other characteristics of the country's non-British railways, a few words are introduced here on Brazil in general—and the Brazilian in particular—in the hope that those who expect to cultivate the somewhat extensive field which that country's railway possibilities will eventually offer us, will profit thereby.

The first thing which an uninitiated American should do in a plan for the cultivation of the South American railway



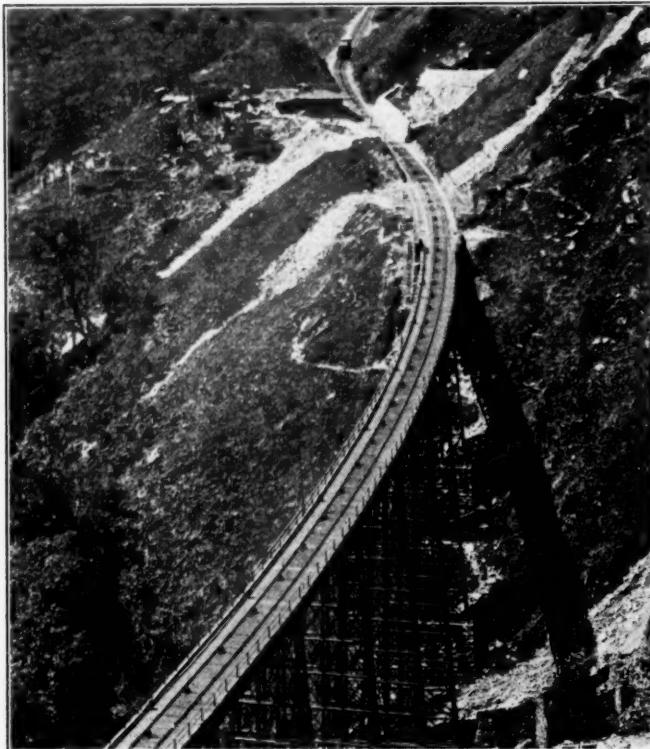
One of the Sao Paulo's Pacifics

Geraes, Rio de Janeiro and Espirito Santo. Its route follows the Paranhya river for some distance and then strikes out across a series of mountain ranges involving very heavy grades. This company has 220 locomotives, 278 passenger cars and 2,350 freight cars.

There is another British railway of considerable importance in Brazil, the Great Western of Brazil, the zone of influence of which radiates from the Port of Pernambuco, located in the northern part of the state of that name between the parallels of latitude 5 and 10 south. This road traverses the states of Pernambuco, Alagoas, Paranhya and Rio Grande do Norte. Its mileage is roughly 1,000, the gage is one meter and it has 160 locomotives, 255 passenger cars and 2,200 freight cars. Further British railway interests are to

supply market is to correct the almost universal impression which he may entertain that South America is merely South America instead of, as it is, a number of distinct countries. The belief that that continent is inhabited simply by South Americans, and not by Brazilians, Peruvians, Chileans, etc., does not, for business reasons, reflect to the advantage of the would-be exporter to those fields. A thorough familiarity with the geography of South America is a paramount requisite to success. After such familiarity is attained, the intending trader can be figuratively said to have learned to crawl. Learning to walk involves a knowledge of the numerous fundamentals included in whole libraries which have been written on the subject of "trading with Latin America," the sole intent of which is to save money and time for Americans who wish to develop this trade which they, in comparison to their European—and particularly their British—competitors, know relatively little about.

South America should be thought of in the sense of its respective countries and considered as Spanish America and Portuguese America. Brazil is Portuguese America and has nearly half of the area of the whole continent, representing a single country as large as continental United States, the British Isles, the Netherlands, Belgium, Portugal and Switzerland, all combined—a fact which is not generally appreciated. The word "immense" is not misused in referring to

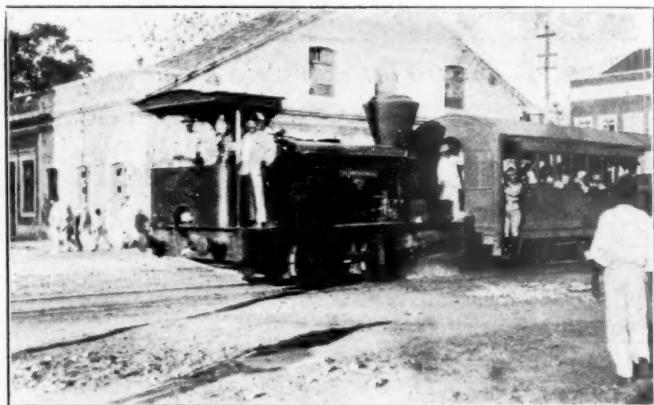


Gruta Funda Trestle on the Old Line of the Sao Paulo

this, the largest South American republic, with its 3,292,000 square miles of territory and a population of 24,000,000.

Along with other considerations comes language, the average American's ignorance of which is not making him popular in those countries where its knowledge would give him an insight into the thoughts of the people which he can get in no other way. It is generally believed by a majority of Americans that the language of South America is Spanish and they let it go at that. *Spanish America* on that continent speaks *Spanish*; *Portuguese America—Brazil*—speaks the language of its founders, *Portuguese*, and nothing else. In both of these divisions, both English and French are spoken and understood, but for all practical purposes the

languages of those lands are *Spanish* and *Portuguese*. It is quite as reasonable to go to Chile or Peru and expect to do business successfully in *Portuguese* as it is to tackle Brazil with Spanish propaganda either written or spoken. The inhabitants of neither of these two great divisions will acknowledge the superiority of the official language of the other. On the contrary, each will strenuously maintain, in a friendly manner, that their's is the original tongue and that the other is merely a dialect. The lack of comprehension of this important subject, particularly in its reference to Brazil, constitutes the rock upon which has been wrecked many an otherwise worthy effort on the part of American merchants to introduce goods in the latter country. Any doubt as to the damaging effects of trying to win the



A Street Railway in Pernambuco

Brazilian with Spanish literature will be easily allayed by a talk with any of the American representatives of the Department of Commerce in the respective cities in which they are located. Although the Spanish descendant can read Portuguese (and will read it in a pinch if the information is unavailable through any other means), and the Brazilian can likewise read Spanish (and will decline to do so in a majority of cases), both will prefer to read advertising in English rather than in the neighboring tongue.

The Brazilian gentleman, who upon opening his mail drew forth three letters in Spanish from inspired but wholly ignorant correspondents of business houses in the "States" and dumped them into the waste basket unread, voiced the sentiment of Brazil's entire business community when he expressed the fervid wish that progressive America would "wake up" to the fact that the language of his country was not Spanish, but *Portuguese*. Fortunately, due to the educating influence of many publications devoted to the interests of American export trade, the truth is gradually spreading. Consideration of the Brazilian likewise involves a study of his history and his habits today. Unlike the case of many of his neighbors, his projects are his own. He points with pride to the fact that big enterprises in his country are, in a majority of cases, operated with Brazilian capital and by Brazilian people. In this connection, he is especially proud of the fact that most of the railways are not an exception to the rule and he hopes that, in due course of time, the movement to nationalize the lines will result in success.

To the intending cultivator of the Brazilian railway supply market it may be mentioned in passing that both the Baldwin Locomotive Works and the American Locomotive Company maintain branch offices in the city of Rio de Janeiro under the direction of men, who, in our vernacular, "know the ropes" in regard to the railroad trade in those parts. Their knowledge of the possibilities of the field from an American point of view is worth having and their advice, along the lines of approaching the prospects, will follow

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in some degree the tenor of the discussion written above. Their information and admonishments will, if mixed in a proper degree with the opinions and advice of Brazilians who know, provide the newcomer with an asset of worth.

Although Brazil, to use familiar terms, is "three times as big" as Argentina and has three times as many people as the latter, it has only three-fourths the railway mileage of her well-developed neighbor. This inviting comparison, when considered in connection with the friendly attitude of Brazil's government toward America and things American, constitutes a reasonable basis for hope and an inspiration for the future, *commencing now*.

A table of 27 Brazilian railways sets their combined 1915 mileages at 13,340—approximate figures and close enough for the purposes of this article. Among them, they are reported as owning 1,350 locomotives, 2,370 passenger cars and 21,500 freight cars. Deducting the combined mileages of the five British railway enterprises mentioned previously as about 4,000 and their 536 locomotives, 700 passenger cars and 8,216 freight cars, there remains that in which the American manufacturer of railroad machinery and supplies of all kinds is most interested and which might be called, for reasons due to the economic situation resulting from the war, a temporary American market. Just how permanent that market can be made is a matter of American determination, plus an inclination to study carefully the rules of the game, plus the use of common sense in their application, tempered with a knowledge of the psychology of the situation. It sounds like a lot of precautions, but the observance of these little details put tiny Belgium at the head of the list of shippers of railway materials to Brazil in the year 1912. The war's effects upon the situation resulting in America's opportunity in this direction, is ably illustrated by the following comparative table of the railway supply imports for Brazil, by countries of origin, for the years 1912, 1915 and 1916, expressed in American dollars.

Country of origin	1912	1915	1916
Belgium	\$8,025,991		
United States	6,106,622	\$745,784	\$1,793,360
Germany	3,500,863	17,730	
England	2,546,000	427,159	234,056
France	2,265,455	1,154	1,020

The significance of these figures is hard to grasp. The total of the first column represents a business in the shipment of railway supplies for one year (1912), contributed to by five nations, of \$22,444,731. As England is still in the game, and more active now than ever in her determination to maintain her world trade, quite an admirable resolution to be sure, it might be just as well to subtract that country's quota of \$2,546,000, which may have gone to her own national roads in that country, leaving a balance, in round numbers, of a business of \$20,000,000. This deduction is advised in spite of the table's showing a decline of Britain's share from over \$2,000,000 to a little over \$200,000, for it will be well to bear in mind, as stated before, that England, in spite of the damage suffered in the war, is still in the game. Just how well she is doing, in spite of the contentions of those who would have us believe that she is out of the railroad supply business and that we are going "to get it all" simply because we are not so badly "crippled" as she is supposed to be, is indicated by some highly interesting figures from the British Board of Trade. They show that in the months of January and February, 1919, Great Britain exported \$3,134,357 worth of railroad supplies. In the corresponding months of 1920, in a short space of a year, the value of those same exports reached a sum of \$16,328,369—a little matter of only 429 per cent increase.

Great Britain, therefore, is America's competitor in the market of Brazil and, for that matter, in all of the markets of South America, and it is for those reasons exceedingly logical in discussing the possibilities that those markets are

said to offer, to deduct the British owned lines and give the intending exporter the benefit of the doubt. If, as frequently happens, a good size order from a British owned railway accidentally, or for some unknown reason, falls to an American concern, all right; we are not ungrateful and will try to please in the hope that we will again be favored. However, in this respect, the Brazilian government's increasing influence in the management of all railways and its lively interest in economy creating devices offered by American manufacturers encourages, at least, a hope for business on even the English owned lines, although this qualification cannot be taken as a guaranty of rewards for efforts spent in that direction.

New Issue of Great Northern-Northern Pacific Bonds Proposed

WASHINGTON, D. C.

A NEW PLAN for refunding the \$215,227,000 of joint 4 per cent bonds secured by a pledge of the stock of the Chicago, Burlington & Quincy, which mature on July 1, was filed with the Interstate Commerce Commission on March 25 by the Great Northern and the Northern Pacific. The new plan, for which the authority of the commission is asked, provides for the issuance of \$230,000,000 of 15-year 6½ per cent joint convertible gold bonds secured by the pledge of the Burlington stock, of which with the increase of \$60,000,000 recently authorized by the commission, the two roads now own 1,658,674 shares, plus \$33,000,000 of 6 per cent bonds of the Northern Pacific and \$33,000,000 of 7 per cent bonds of the Great Northern. The joint bonds are to be callable in whole or in amounts of not less than \$5,000,000 on 75 days' notice at 103 per cent and convertible into bonds of either or both the Northern Pacific and Great Northern under provisions which the application says it is believed will insure the early substitution of mortgage bonds and a gradual division of the Burlington stock which would thus be released. This would provide for a separation of the joint control of the Burlington.

This plan, which has been carefully considered by the officers of the roads after conference with the commission and with bankers, is proposed as a substitute for the earlier plan which could not be carried out because the commission by a five to four decision refused to authorize the issuance of \$80,000,000 of bonds by the Burlington against its surplus, the proceeds to be used to retire a part of the joint bonds at maturity and thus reduce the amount to be refunded.

The joint application asks approval of a joint trust indenture to be dated on or before July 1, 1921, to be executed by both applicants to the First National Bank of New York as trustee, and of the issue of the \$230,000,000 joint bonds on or before July 1. Approval is also asked of the pledge as collateral under the indenture of the 1,658,674 shares of Burlington stock owned by the applicants and now subject to prior pledge under the indenture securing the outstanding joint fours; also the issue and pledge as collateral of \$33,000,000 of refunding and improvement mortgage 6 per cent bonds, series B, of the Northern Pacific due July 1, 2047, callable after 15 years or any interest date on three months' notice, at 110 per cent; also the issue and pledge as collateral of \$33,000,000 of general mortgage 7 per cent bonds, series A, of the Great Northern, due July 1, 1936, non-callable. Approval is also asked of a general gold mortgage of the Great Northern, dated January 1, 1921, to the First National Bank of New York as trustee, providing for an authorized issue of \$140,000,000 of general mortgage 7 per cent gold bonds. Approval is also asked of the issue by each applicant under its mortgage, in event either of payment of joint bonds or their conversion into mortgage bonds, of mort-

gage bonds against deposit and pledge of Burlington stock.

It is proposed to issue and sell the new joint bonds on or before July 1, through a contract to be made with a syndicate of bankers upon the syndicate undertaking to provide the money which will then be required to pay the outstanding 4 per cent bonds, but no such contract is expected to be made until approved by the commission.

The outstanding joint bonds are said to be held by more than 18,500 holders. Applicants have no available funds with which to make a substantial payment on the bonds but they are advised by bankers and believe that, being unable to have recourse to the plan previously presented to the commission, the best and only sure method of raising on July 1 the necessary funds is the proposed issue of convertible bonds. The application says that collateral trust bonds secured on stock alone as collateral are no longer legal investments for insurance companies under the laws of New York, nor will they be purchased by insurance companies, savings banks, trust companies or similar financial institutions or trustees. It is, therefore, necessary, in order to reach this market, to offer, either directly or indirectly through conversion, securities which will be legal investments under the insurance laws and for savings banks and trustees.

The commission has sent notice of the filing of the application to the governors of the States through which the roads operate and has assigned the application for hearing before the commission at Washington on April 11.

Results of Railroad Electrification*

By C. C. Whittaker

Railway Engineering Department,
Westinghouse Electric & Manufacturing Co.

STUDY RAILROADS are studying the problems of electrification. Now and then some road, pressed a little harder than the others for increased road, tunnel or terminal capacity, or for lower operation costs, arrives at the solution which is the answer to its own particular requirements. That these solutions have been justified is evidenced by many statistical testimonials from these electrified roads.

Studies on the substitution of the electric locomotive for steam motive power on various railroads have indicated that the resulting operating economies are sufficient, not only to carry the charges on the capital investment, but in addition that the flexibility of this type of power permits a greater volume of traffic to be handled over the existing trackage, and thereby obviates additional capital expenditures for increased trackage required with steam operation.

Very often, where certain sections of a railroad have about reached their limit of tonnage with steam operation, it has been found that electrification would enable them to care for a 75 per cent increase in tonnage over the same trackage, and that the capital expenditure for electrification would be less than for the additional trackage and facilities to handle this same increase in business with steam motive power.

In case of electrification, in most cases, operating economies care for fixed charges on this increased capitalization.

Capital expenditure for electrification of terminals has been justified solely by the fact that electric operation afforded the only means of enlarging the traffic facilities. One dead-end terminal in the center of one of our large cities handled a large number of suburban trains. The operation of steam motive power necessitated considerable switching movement in order to remove each arriving train and make it up for departure. Business had increased to that point where it was impossible to take care of the increasing

*Abstract of an address delivered before the Providence Engineering Society, March 15, 1921.

traffic by the introduction of more trains. The physical location was such that it was impossible to increase the trackage facilities at any price. Electrification with the introduction of multiple unit car trains practically eliminated switching and making up of trains, and increased the capacity of the terminal 50 per cent. The cost of electrification was \$3,000,000, and increased earnings cared for the charges.

Another of the principal electrifications on a heavy tonnage coal-carrying road was undertaken primarily to increase the facilities of their present trackage. This section amounting to about 30 route miles of grade and 100 miles of trackage was the limiting factor in their operation, as it represented the congested section of the system. The study of electric operation indicated that the tonnage capacity of this trackage could be doubled with electric motive power, and that the saving on the difference in investment for electrification, and that necessary for additional steam equipment, was a very attractive figure. As a matter of fact, the traffic on this road after electrification did double, and the figures given in the report were justified. These figures are as follows:

	Electric Operation	Steam Operation
Gross investment	\$2,939,000	\$1,090,000
Net investment	1,849,000	.....
Operating expense	500,760	925,165
Saving in operation.....	\$424,385	
Return on gross investment.....	14.45 per cent	
Return on net investment.....	23.2 per cent	

In this tabulation the savings were largely effected by reduced maintenance and overtime crew expense. The cost of generated power was practically the same as for the steam locomotive, due to the fact that the location was in the coal mine district, and coal was cheap.

Studies in other localities where coal is scarce and expensive, and where power is developed by hydraulic plants, show economy in operation due largely to the saving made in the cost of power. This is indicated by the results of a study of a single-track western railroad of this type, where congestion was not involved, and the general method of operation with electric power is quite similar to that of steam. The section represented 133 route miles of single track, and the following tabulation is made on the bases of providing for a 40 per cent increase in business.

	Electric Operation	Steam Operation
Gross investment	\$12,961,000	\$3,599,260
Net investment	8,961,740	.....
Operating expense	3,826,381	5,530,217
Saving in operation.....	\$1,703,836	
Return on gross investment.....	13.6 per cent	
Return on net investment.....	19 per cent	

In considering steam railroad electrification, we must not look for any sudden conversion from steam propulsion to electric. From the date of the first steam engine to the present time, there appears a long succession of improvements and perfection of detail so that at no time, or certainly not at the present day, is one justified in saying that there is nothing more to expect from this system of railroading.

The development of the steam locomotive has been typical of the development of other mechanical necessities, the first efforts demonstrating little more than principles involved. From the first wood burners of a few thousand pounds weight up to the up-to-date Mallet, fitted with mechanical stokers, superheaters and all auxiliaries, weighing several hundred tons, we get some idea of the progress made.

Coincident with locomotive development, other developments essential to the use of improved locomotives, either steam or electric, such as roadbed, rolling stock, signal service, etc., have kept pace with each other.

At the present time, when more and more is required of the railroads in the way of increasing their carrying capacity and expediting their movements, in order to meet the near future demands on most railroads, there is but one economical answer, and that is to electrify.

Further Methods of Increasing the Car Load

Contributors to the Contest on This Subject Suggest Various Methods for Obtaining Improvement

THIS IS THE THIRD of a series of articles on the subject of increased car loading which were submitted by representatives of the railways and the shippers in the contest on this subject. The prize winning papers and three others were published in the *Railway Age* of January 28 and six other papers appeared in the issue of February 11. In this issue nine contributors present a variety of suggestions designed to aid both the shipper and the carrier to increase the average loading of the cars to their mutual benefit.

The Solution Is in a Graduated Freight Rate

By M. Nicholson

General Manager, Chicago, Milwaukee & St. Paul, Seattle, Wash.

The benefits derived from increasing the average load per car in excess of traffic minimum or commercial trade units during times of car shortages, are overwhelmingly in favor of both the shipper and receiver of freight, which the shippers generally do not appreciate. The railroad benefits to a considerable extent, but the shipper's advantage is so apparent that there should be a concentrated effort on the part of shippers to sell and have moved the largest unit that any freight cars will carry.

Continued efforts put forth by the War Board, prior to government operation of railroads, the Food Administration during government control and the railway officers at all times increased the average load per car from 10 to 15 per cent. Shippers were appealed to from a patriotic standpoint and a satisfactory response resulted. Following the close of the war, the old trade units were in most cases re-established and based on published tariff minimums which were established when the average capacity of freight cars was between 40,000 and 50,000 lb. The shippers generally took the position that carload trading was on the basis of so many dollars per car for the commodities rather than so many pounds for a car.

Having followed the subject of heavier car loading for the past four years and as a member of the original commission on car service, having fathered the heavier car loading under the original War Board, the writer feels justified in making the statement that the freight rate will alone govern the quantity of any commodity shipped in a freight car. The method which will produce the results required is similar to our commercial system of trading. Smaller quantities are sold at a higher price to cover the increased handling cost. A purchase from a retail store is necessarily at a higher price than the wholesaler demands from the retail merchant. The wholesale firm purchases in larger quantities and gets a lower price from the jobber or manufacturer. The difference in price of the article is influenced by the quantity involved in each transaction. The same system applies to transportation and is recognized by one rate established for l.c.l. shipments and another rate much lower in most cases, established for c.l. shipments, the distinction being made on account of the relative difference in handling cost.

It would not be contrary to past or present principles to differentiate between quantities shipped in carload lots. Assuming that the present rates can be used as a basis, they could be applied to the maximum carrying capacity of the car furnished to a shipper for loading. This maximum carrying capacity being based on structural strength or cubic capacity. Then graduate the rates upward where full capacity of equipment furnished is not used. As an

example, an 80,000-lb. capacity car fully loaded with any commodity would take the present rate. The same car loaded with 60,000 lb. would take a 10 per cent increase in rate and the same car loaded with 40,000 lb. would take a 20 per cent increase. This plan is in conformity to the rules of trade and would offer to the shippers present rates for wholesale transactions and require the payment of a slightly increased rate for a retail transaction.

Stimulate in the Interest of the Employees and the Public

By A. P. Brown

Secretary to Superintendent, Southern Pacific, Tucson, Ariz.

Due to competition and the desire to give service, most railroads lose in l.c.l. or package freight loading. However, this loss could be overcome to a certain extent by a revision in the shipping day schedules for package freight where the service required will permit. This would not necessarily result in a decrease in the efficiency the carriers render the public, but would, in a great many instances, benefit the service and increase the carload. Only where this result could be obtained should a change be made.

Much car capacity can be saved in the loading of railroad company material by establishing days for company material shipments, stopping such cars enroute to have the load filled out with other company material which is to move in the direction the car is moving. To do this requisitions should be placed and filled to conform to the loading schedule, in order that the full car load may be secured.

In order to create keener interest in a campaign of this nature, it is at times well to offer nominal prizes to agents for the best commodity loading, giving due consideration to the business offered in different sections, and make the contest of such a nature that competition for the prizes would be universal on the railway system offering them. Interest would have to be stimulated from time to time by means best suited to the campaign; comparative statements, circular letters, or other forms of publicity.

However, to obtain the maximum results the public is the most important factor in the campaign. To attain the goal desired in car loading it is necessary to solicit and receive its co-operation. An educational campaign could be conducted to increase the load per freight car. In addition, the shippers could be solicited directly by means of attaching posters to freight bills, typing or printing phrases about car loading in conspicuous places on stationery, etc. Without the public's aid our campaign would be a failure.

Raise the Carload Minimum

By C. H. Bristol

Assistant General Manager, Atchison, Topeka & Santa Fe, La Junta, Colo.

During the past two years the Santa Fe has conducted a vigorous campaign in the direction of heavier loading, the matter being watched very closely by all concerned from the general managers, superintendent of transportation, car accountants down to the agents. We have always required daily reports from agents showing in itemized form the cars loaded, commodity capacity of car, weight of load, etc.; these reports are checked by the superintendents and assistant

general managers and any cases of light loading noted are handled at once with shippers through the agents or by a personal call from the superintendent or other representative of the railway. A consolidated report is rendered each month showing the average loading by commodity. It is the practice to take up individual cases where it would seem that the loading might be increased, and it has been found the majority of shippers are willing to co-operate to the best of their ability in this direction.

In a campaign of this kind the result to be obtained must necessarily depend to a large extent, if not entirely, on the shipper; and it goes even farther, involving the jobber and commission man or large dealer who buys in carload lots. These people appreciate the importance of maximum loading and realize the benefit of making one car do the work of two. They are, however, frequently handicapped by the buyers, who, for various reasons, hold their orders down to the carload minimum as set forth in the tariff. This seems to be especially true right at this time, as the merchants and others are buying only what they have to. For this reason it will be necessary that the revision of such carload minimums be given immediate attention if we wish to get the maximum out of our equipment.

Effective Crating Is Important

By N. A. Ryan

Trainmaster, Chicago, Milwaukee & St. Paul, Milwaukee, Wis.

To gain the mark of 30 tons per car as an average load will require a great deal of careful thought and hard work on the part of railroad officers and employees. So much can be accomplished in a small way along these lines—for instance, if each shipper would increase his loading even 100 lb. per car, many additional cars would result. This is merely an illustration of how easy it is to accomplish something along these lines.

An enormous amount of space is wasted in a great many cars and the best way to increase loading quickly and generally is to maintain high minimums in our several classifications on commodities that will stand it.

The proposition of economical and efficient crating and packing of products is a large study in itself for any concern and if the packing is efficiently done much space is saved. The use of awkward and odd shaped packages should be avoided wherever possible.

We do not give enough thought or time to the instruction of our district clerks in large terminals. These men can do more toward increasing loading than any other railroad employees. They distribute the equipment and sign for the freight and see a great deal of it loaded. They should be taught that when they see a shipper wasting car space they should call his attention to it, or notify the agent or a traffic representative that a call on the shipper would be of benefit, as in some cases the railroad representative might be able to tell the shipper something about his shipping department he did not know and would be glad to correct when informed of it. The clerks should also be instructed in car distribution in order that they will distribute the available equipment economically and intelligently.

The railroads handling their own material are as a general rule about the most extravagant of any shipper in the use of equipment and much can be accomplished by education in store rooms, material yards and shops. The intelligent placing of the right size and class of equipment by the yardmaster in charge of store and shop districts is also a very important item. A systematic check should be made at freight houses and transfer platforms daily by the agent and periodically, by a loading inspector or other traveling inspector to see that the freight is properly loaded, that cars

are not being used extravagantly, and that cars are loaded as heavy as should be, taking into consideration the chances of damage enroute.

What the Shipper Can Accomplish

By R. G. Kreitler

Manager Traffic Department, Goodyear Tire & Rubber Company, Akron, O.

About three years ago the company with which the writer is connected undertook to secure increased loading of cars. The first step was to eliminate l.c.l. shipments to the 70 branch houses maintained throughout the United States at that time. During the first 3 months and 20 days of these efforts l.c.l. shipments to branches were entirely eliminated and the loading per car increased by 69 per cent.

It is impossible to load the finished product of this company to 30 tons because of its bulk and its low density per cubic foot. The minimum provided for pneumatic tires is 20,000 lb. per car and for solid truck tires and other classes of material, 30,000 lb. per car, but even with this low minimum by making a study of the best methods of loading cars and securing concessions from the various classification committees in the way of packing requirements, it was possible to produce a loading of all classes of material, including both pneumatic and other classes of rubber goods, at an average of 30,325 lb. per car for the year 1919.

In many cases it was not possible to load to the visible capacity of the car by reason of the manner in which orders were placed by the customers. In this connection it is suggested that sales organizations in co-operation with purchasing organizations of their customers might be induced to co-operate to the end that customers in placing their orders would have it understood with the seller, that cars should be loaded to the full visible capacity so far as possible. On inbound shipments, consisting of various kinds of raw materials, etc., the average loading per car was 79,535 lb. The average for the total movement, inbound and outbound, was 58,155 lb.

One of the greatest evils, as it affects the larger use of equipment, is the custom on the part of many receivers of freight to order far in excess of their daily requirements, the result being that they have a large accumulation of loaded cars on hand. However, all of the fault in this respect does not lie with the shipper or the receiver by reason of the unreliability of the service offered by the carriers. It is disconcerting to a shipper who is actually trying to get the fullest possible use from railroad equipment by loading up to the visible or carrying capacity of the car to send forward a shipment destined to a point to which ordinarily they would make delivery in six days and to find the car actually going through in from 60 to 85 days.

What One Division Accomplished

By F. E. Slater

Southern Pacific Railway, Dunsmuir, Cal.

The following is a brief account of the methods used and results secured on the Shasta division of the Southern Pacific in increasing carloading during 1920. To start with it was necessary to ascertain the approximate number of cars of each commodity that each shipper would ship during the year, therefore in the month of January, 1919, every agent was requested to interview the shippers in his territory and secure this information first hand. During the early part of March a letter signed by the superintendent was sent to each shipper, each letter being worded slightly different to avoid having the appearance of being stereotyped. The following is an abstract of a typical specimen:

"I feel reasonably sure that a majority of the large shippers

are acquainted with the shortage of equipment at the present time, due principally to the reduction made in the building program during the past several years, and one of the best methods of combating this shortage is by loading what cars we have to 100 per cent capacity.

"I appreciate that you are often confronted with obstacles that are hard to overcome; however, when the opportunity is favorable considerable can be accomplished. Should you have any suggestions to offer whereby we can assist you in accomplishing better loading, I would appreciate your taking up the matter with me promptly."

While no reply was requested, not a shipper failed to answer the communication and assure us of his co-operation and many of the suggestions received were followed up by a division officer who investigated them personally and reported his findings. Those meriting it were favorably acted upon, thus assuring the shipper that we were anxious to do our part.

As a result of this campaign, instead of showing a loss of over 3,000 cars as during the year 1919, a saving of 4,933 cars was accomplished for the period from March to September, 1920, alone, the period beginning March being selected, as it was during that month that the appeal was made to the shippers. The following tabulation shows the result by months for 1920 as compared with 1919.

Month	Average tons per car		Per cent of contents to capacity	
	1919	1920	1919	1920
January	36.0	27.9	83.8	69.5
February	32.2	30.1	77.6	78.1
March	30.9	31.8	78.1	80.7
April	29.8	32.3	79.5	83.4
May	27.2	32.1	72.8	80.1
June	29.6	32.3	79.5	78.2
July	26.8	29.3	68.5	80.1
August	28.8	37.4	73.9	92.4
September	27.9	36.8	74.2	89.5

Have a Consistent Policy

By A. T. Mercier

Superintendent, Southern Pacific, Portland, Ore.

Two things enter into the attainment of an average of 30 tons per car. (1) When practicable, furnish a car of the size required. (2), load to maximum space or weight capacity.

In attaining the latter, the carriers rely very largely upon the personal contact of the local agent with the shippers, as it is only through the influence of the local agent in many instances that the shipper can be prevailed upon not to take advantage of the minimum weight. In this connection, consideration should be given to the question of raising the minimum carload on various commodities as the existing tariffs work very greatly against attaining the maximum carload.

In this territory we have been working energetically to obtain maximum carloads. It is a matter of education that must be guarded very closely, as the shipper will lose interest in car conservation if after being inconvenienced and incurring additional expense, to supply a maximum load the car were permitted to remain on his siding an excessive length of time before being moved.

Some Lading Requires Special Treatment

By G. C. Conn

General Traffic Manager, Buick Motor Company, Flint, Mich.

The question of heavy loading of freight cars is like the "Tariff," a local issue. The great variance of commodities and the lack of uniformity of railway equipment almost obliges each territory to work out its own salvation. Assuming that everyone does his best to load heavily, and usually a shipper will load all he can in order to get more money in return, there are conditions under which the cubical capacity and not the weight capacity of the car must govern the load.

In Michigan, for example, an unusual number of light and bulky articles are produced such as hay, beet pulp, refrigerators, sewing machines, kitchen cabinets, furniture, woodenware, automobiles and other commodities. These all require large cars in order to get the minimum load, and the weight capacity of the equipment is never reached. So far as automobiles are concerned, it is not a question of tonnage capacity. This is why automobiles pay the highest rate per ton per mile of any regular carload traffic. Large cars with wide doors are absolutely essential.

The Buick Motor Company and other units of the General Motors Corporation have purchased several trains of flat cars for moving automobiles. These are equipped with steel decking with the result that the load is doubled. There is no question but what double decking is feasible on open as well as closed cars for a great variety of tonnage. Shippers must experiment and find the method best adapted to their business.

Railroads Should Set a Good Example

By G. F. Burns

Traffic Manager, United Drug Company, Boston, Mass.

It is absolutely necessary that the carriers furnish dependable equipment. Shippers can hardly be expected to load to the maximum, if such action will result in merchandise being transferred en route, as is now infrequently the case, because of faulty equipment.

The carriers' methods of loading and stowing merchandise at terminals and freight houses could be very much improved upon. In a comparison between the loading of cars by private industries and by carriers, particularly so-called merchandise or package cars, it is believed that the cars loaded by the shippers will show to much better advantage. Visits to the terminals of various carriers where there are a number of merchandise cars loaded daily lead to the opinion that these cars are, as a whole, insufficiently and improperly loaded.

It is believed that the carriers could utilize equipment loaded by themselves to much better advantage and that many shippers would load much heavier if they felt reasonably sure that a transfer en route would not result, because of cars being too heavily loaded.

Are We Buying Coal Enough?

D R. GEORGE OTIS SMITH, director of the United States Geological Survey, and F. G. Tryon, coal statistician of the Survey, have issued a statement making the following analysis of the obvious facts in the present coal depression:

During the first week of March the operators at some 2,600 soft coal mines reported to the Geological Survey that they worked on the average only 19 hours out of the possible 48 working hours in the week. They were closed down, so they stated, on account of "no market," or lack of orders, an average of 26 hours. They lost a little time on account of labor shortage, and a smaller amount because of local strikes in Kansas and Missouri. Here and there a mine lost a few hours' working time because cars were not placed when ordered, or because of mechanical breakdowns. But the loss on account of all these other factors combined was only 2½ hours as against the 26 hours—more than three days—because of lack of demand.

Making due allowance for what may have been happening at other mines not reporting to the Survey and for the fact that no mine can in practice long maintain output at 100 per cent capacity, it is still clear that the soft-coal industry

is at the moment very short of business. It has 8,000,000 tons a week of demonstrated mine capacity lying idle, and what is worse, piling up capital and maintenance charges waiting for the consumers in the United States or abroad to place their orders. Most serious is the fact that the bituminous coal industry has a veritable army of unemployed. The 615,000 mine workers are offered not over three days' work a week, and at many mines only two or even one day. Coal miners in the United States draw a pretty good day's wage, but they cannot continue indefinitely to make ends meet on one or two days' work a week.

It may be charged that even in times of active demand the railroads cannot provide cars to keep the mines busy continuously. Very well, then, measure the present depression against what we know the railroads can do. In the first week of March the output was 7,263,000 tons. The next week it dropped to 6,891,000. The preliminary figure for the third week of March (14-19) is 6,525,000. Now, four months ago, before the market broke, the railroads were furnishing cars enough for an output of over 12,800,000 tons a week. Indeed, on two occasions in the past, when extraordinary measures were invoked to stimulate car supply at the mines, the railroads provided transportation sufficient to get out a total of 13,100,000 tons. Thus the present rate of output is less than half what the carriers can handle under pressure, and a good 6,000,000 tons short of what they were doing only last December. The best demonstration that the roads stand ready to handle more coal is that they have some 204,000 open cars lying around idle on sidings, according to the American Railway Association. Because these cars are idle the roads are discharging men by the thousands. And as in the case of the idle mines and machinery, so with the idle cars; not only are they bringing the roads no revenue, when revenue is badly needed, but they are steadily eating up other earnings with capital and maintenance charges.

All signs, then, point to the consumer as the controlling factor in the present situation. Of course the coal man has come to expect a period of dullness in early spring as one of the drawbacks of his seasonal business. But this year the slump is far worse than the normal, even considering the mild winter. For the consumer is having troubles of his own; the business depression has reduced his requirements. In December last the beehive coke ovens, for example, were taking 600,000 tons of coal a week. Today they are using only 270,000 tons. Somewhat the same reduction has been going on in other domestic industries and at the same time exports have also fallen sharply. With current consumption curtailed in this manner it is clear that the mere fact that production is down to six and a half million tons a week does not of itself prove that consumers are purchasing less than their requirements. Indeed, the rate of output has not yet touched the low point reached during our latest real business depression, in 1914. That, however, was seven years ago, and our normal rate of growth has been such that 7,000,000 tons in 1921 would be as low as 6,000,000 was in 1914. If the business depression proves to be long-sustained, then the present low rate of production carries no threat of an approaching shortage of coal. If, on the other hand, business should suddenly resume at full blast we know that the railroads will hardly be in a position to haul coal enough to rebuild stocks, meet current consumption, and handle other freight at the same time without signs of distress.

There is reason to believe, however, that the business depression is not the only consideration in the mind of the consumer at present. He remembers what he used to pay for coal before the war. He recalls that he could then get an abundance of coal for \$1.15 f.o.b. mine. He knows that on the average in 1918 coal was costing \$2.50 or \$2.60 at the mine. He sees that prices of many other commodities have fallen since 1918, and then he takes up a copy of "Coal Age"

or "The Black Diamond" and notes that the lowest price quoted on spot coal is \$2 run of mine, f.o.b. mine, with many quotations at \$2.50, \$2.75 and \$3, or over. He finds that little coal is offered for contract at less than \$3 a ton. He remembers, with resentment, the prices he had to pay last year, and he decides to buy only as needed and wait for the price to come down to a reasonable figure.

The operator, however, retorts that the price has gone down as far as it possibly can; that many mines have been in consequence forced to close, and that with the successive wage advances of April, 1916, April and October, 1917, and March and August, 1920, the cost of producing coal has so increased that a return to pre-war prices is impossible. The consumer must awaken to the fact, argues the operator, that whereas before the war he would think in terms of \$1.00 or \$1.25 coal, now he must think in terms of \$2.50, \$3.00, or \$3.50 coal f.o.b. mine.

Insofar as the consumer is waiting for the price to come down, at the risk of depleting his reserves against winter requirements, the relief turns upon a question of fact, namely, whether the present market price of coal is a reasonable price, whether it is as low as can be expected later. It is to be regretted that the Federal Trade Commission has been enjoined from learning the facts and so is not able to issue a statement of present-day costs that would enlighten the public.

"Buy only as needed" may prove too conservative advice at this time. The consumer waiting for low prices and the producer delaying price adjustment might be found equally responsible for the uneconomic seasonal fluctuation in coal output. "Buy only as needed" may result in cheaper coal in the bin, but the bin may be too nearly empty much of the time when the need is greatest.

The plain situation is that the coal buyer distrusts the coal seller and "no market" as given in the weekly returns in part simply reflects the consumer's attitude. His answer to offers of contracts may be natural, but is it safe?

The consumer must ask, "Have I sufficient stocks in my bin to tide me over a period of bad weather, or an interruption to my supply, in view of what I shall need to make the goods to fill the orders I expect to have?"

To the railroads the question becomes, "Have we as the largest consumers of coal laid in an adequate reserve against the period of active business which must one day come?"

And not the least searching should be the question asked by the producer of himself, "Have I made the utmost possible concessions to the user of coal? Have we as an industry done wisely in opposing the collection and publication by the federal government of data on the costs of production?"

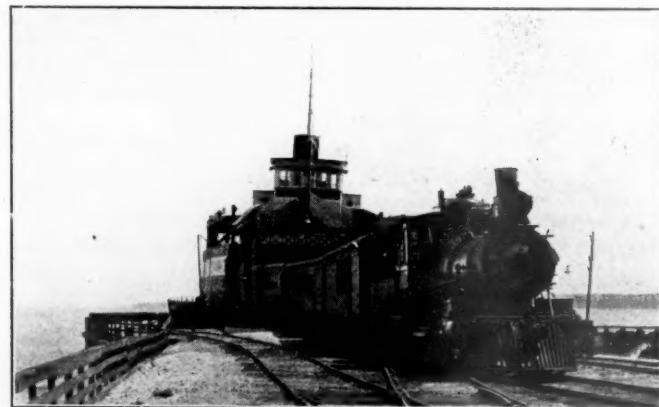


Photo by Ewing Galloway

Duluth, South Shore & Atlantic Train Ferry, St. Ignace, Mich.

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Practical Propaganda for Fuel Conservation

Fuel Conservation Committees a Force for Fuel Economy on the Delaware & Hudson

A NYONE HAVING OCCASION to visit a shop or terminal on the Delaware & Hudson is at once impressed with what might be termed the spirit of conservation. A neat, orderly arrangement of parts usually bespeaks attention to detail and the elimination of waste. The impression deepens at the sight of a well-proportioned bulletin board conspicuously mounted just outside the engine dispatcher's office. In the glare of an electric light immediately over the board Fuel Conservation Bulletin No. 5 gives a very vivid description of what may happen as the result of pulling air hose apart under pressure. There is an illustration showing a sectional view of a hose weakened by being pulled apart under pressure with the following explanation:

"The picture shows the result of pulling hose apart under pressure. This practice punctures the inner tube when the hose straightens out, due to the nipple being at an angle of 45 deg. This practice also destroys the inner tube, allowing the pressure to reach the canvas wrapping, causing air leaks which are difficult to discover by inspection, and in a short time will cause a bursted hose, resulting when freight trains are in motion in an emergency action of brakes, sometimes buckling trains, causing derailments and detentions.

"This destructive practice can be eliminated by parting hose by hand in accordance with Rule No. 4 as covered in the Air Brake Instruction Book. Air leaks and detentions waste fuel and by complying with Rule No. 4 this waste can be eliminated. *Will you help?*"

If we can be persuaded that we need a biscuit because we are forever being reminded of the fact by signboards on every corner and advertisements in every street car, is it not logical to assume that a constant reminder of the fact that fuel may be saved in various ways will have its effect on all loyal employees?

The object of a fuel conservation bulletin is to sell fuel conservation to every employee and so far as practical it should conform to the principles that have made commercial advertising a success. Commercial advertising is a success because its reasoning is logical, its portrayal vivid and its message persistent. The Delaware & Hudson bulletins are good because they are logical; where practical, they are vivid and they have been persistent. What merchant would expect to sell goods on the strength of the feeble, inconspicuous and irregular bulletins that have been attempted by some railroads in the name of fuel conservation?

Some of these mimeographed documents would not serve to sell a postage stamp, much less fuel conservation,

to a skeptical engineman. What the railroads really need in this direction is the same sort of advertising appeal that helped to put over the Liberty Loans—and it would be money well spent.

Getting Co-Operation

Some railroads have failed in fuel conservation because the problem was too big and intangible; they do not know where to start in. The Delaware & Hudson has discovered that fuel conservation is an individual problem with nearly every employee and that the whole-hearted co-operation of these employees is essential. How this co-operation is invited, encouraged and becomes a live factor in saving coal

on this railroad may be observed in the following account of the organization and activities of the fuel conservation committees taken from a manual on fuel conservation published by the railroad:

The committee organization is headed by a General Fuel Conservation Committee comprising:

General manager, chairman.

General superintendent of transportation.

Chief engineer.

Superintendent of motive power.

General fuel agent.

Purchasing agent.

Superintendent of stores.

Master car builder.

Fuel engineer, secretary.

On each division the Divisional Fuel Conservation Committee is composed as follows:

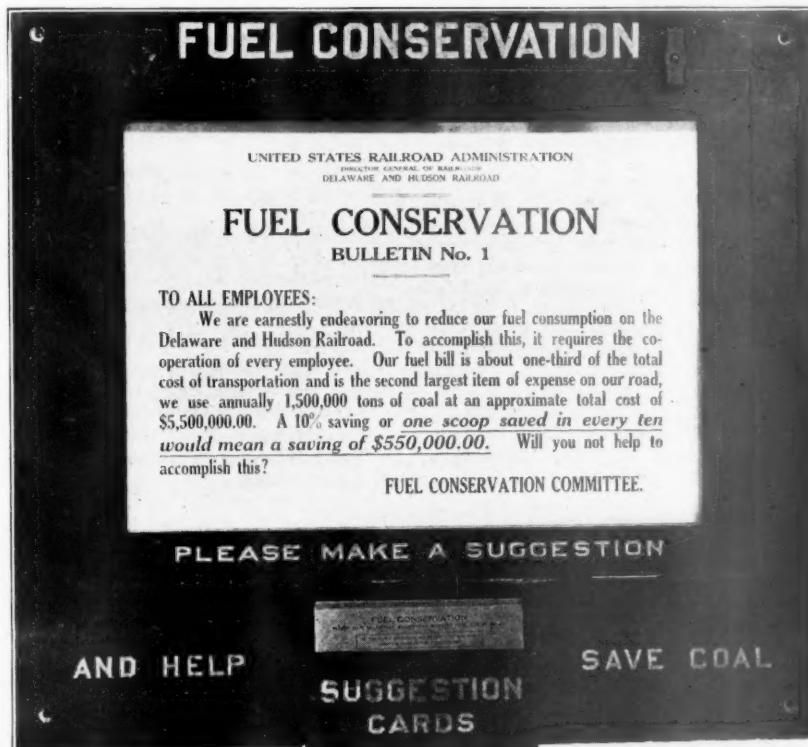
Superintendent, chairman.
Fuel engineer.
Fuel supervisor.
Road foreman of engines.
Yardmaster.

Conductor.*
Engineer.*
Fireman.*
General air brake instructor.

"Those members designated thus * are to be selected for a period of six months by the chairman, in conference with the fuel engineer and the master mechanic. At the end of six months after the first committee has been organized, and each succeeding month thereafter, the chairman will appoint the number of new members, necessary to fill the vacancies from the same branches of the service, so as to bring about a gradual but complete change of members so designated every six months. A member whose term of office has expired will be an honorary member of the committee. Such honorary member is at all times free to make suggestions to the divisional committee on fuel conservation."

The activities of the committee organizations are outlined as follows:

"Fuel Conservation committeemen should always be alert to correct any practice wasteful of railway fuel, making corrections themselves when possible, and at the proper time rendering reports of their activities. They should at all times so conduct themselves as to teach fuel saving by example and precept to all



employees with whom they come in contact and employees should be urged to conserve and save fuel at every opportunity.

"The fuel engineer will act as secretary of divisional committees and prepare the minutes of the meeting and list all suggestions fully on a form provided for that purpose, giving the name of the employee offering same and numbering them in consecutive order.

"All committees must meet during convenient business hours at least once every month at divisional headquarters or other place designated. Members will be required to attend all regular meetings and supervisory officers will arrange to relieve members for the time necessary to attend.

"Members of divisional committees will report to the chairman of the Fuel Conservation Committee on prescribed forms. Every member will furnish the chairman of his committee with a report each month on the form shown in Fig. 1."

Following this outline of the activities of the fuel conservation committees, the purpose of the organization is described as follows: First, to study and correct the wasteful practice in the handling of railroad fuel, such as over-loaded tanks, coal lost in transit, and second, to study, suggest and apply the most economical use of railroad fuel on locomotives, power plants and other places where railroad fuel is used.

How Everyone Can Help

One of the best suggestions ever offered on saving coal appears on the cover of the Delaware & Hudson manual to the effect that if employees will endeavor to save the extra shovelful, the tons will take care of themselves. Suggestions for saving coal are addressed to employees as follows:

"Over 90 per cent of railroad fuel consumed on his division is charged to cost of transportation, and of total cost of transportation the fuel bill is about one-third, hence, superintendents may not only assist in conserving the coal pile but may also reduce his divisional expenses by devoting a portion of his time to a study of fuel conservation and putting his efforts back of the fuel conservation campaign.

"The trainmaster should keep the cars moving and to full car capacity, and wherever practicable avoid moving locomotives over the road light, insist on maximum tonnage over ruling grades and quick movements in and out of yards, and keep in touch with train despaching to insure good and proper train movements.

"The train dispatcher must see that trains are properly despatched so as to avoid as much as possible slow movements over the road and unnecessary delays in sidings.

"Yardmasters can see that incoming and outgoing trains are handled promptly, that proper inspection of trains is made before leaving yards, that locomotives are not ordered before the time that they are actually required and that cars are properly handled on the hump to prevent damage. Rough handling will loosen brake pipe and cylinder connections, resulting in an extra drain on the air pump, air supply and the fuel pile.

"Car inspectors and repairmen should see that all cars are properly inspected and repaired before leaving the yard because improper repairs to brake pipes, brake cylinders, reservoirs, brake rigging, etc., results in fuel waste.

"General foremen and foremen should see that all locomotives receive proper repairs. They should also supervise and inspect all work to see that it is properly done, as work intelligently and properly done will have its influence in fuel conservation.

"The roundhouse foremen should not fire a locomotive up too far in advance of the time it is needed nor neglect to make necessary repairs as called for on engineer's report. He should see that fire is in good condition before the locomotive leaves the roundhouse. If a locomotive is reported not steaming, don't reduce the nozzle; have a talk with the engineer and ascertain the real cause and apply the remedy. Remember steam leaks, poor cylinder and valve stem packing, worn-out grates, valves out of square, improper drafting, exhaust nozzles smaller than required, clogged flues, etc., all tend to waste fuel.

"The master mechanic should bear in mind that since there is not an element of locomotive maintenance that does not in some degree affect fuel consumption, it is therefore of the utmost importance that locomotives are in proper mechanical condition before releasing them to the transportation department.

"Road foremen of engines and traveling firemen must ride locomotives frequently. They should keep in touch with engineers and instruct them how to handle their locomotives economically, also instruct firemen as to economical firing."

What conductors and trainmen are expected to do has been outlined in the following terms:

"See that your train is in proper condition before leaving terminal.

"Make an extra effort to keep your train moving to prevent blocking man back of you, thus requiring him to burn extra coal.

"In freight service anticipate and prepare for station work before you reach the station.

"In passenger service, encourage the quicker handling of passengers, mail and express. (The making up of time lost unnecessarily at stations, in yards, etc., takes fuel.)

"Leaky train lines waste fuel. Keep them tight.

"In passenger service the following will cause fuel waste: leaky steam hose connection, drip cocks too wide open, overheated coaches, all of which tend to add an additional drain on the boiler and fuel pile.

"Give prompt attention to hot journals. A hot journal means increased friction and fuel.

"Watch the brake shoes on your train; dragging shoes, whether due to stuck brakes or to train line leaks, result in fuel loss.

"Keep box car doors closed. Open doors result in resistance and loss of fuel.

"Report for duty early enough so as to leave the yard on time. A locomotive held in yard waiting for the train crew wastes fuel."

Instructions to engineers read as follows:

"Co-operate and assist the firemen wherever possible.

"If your locomotive is not steaming do not ask for a reduced nozzle but ascertain the real cause instead, reporting it to the roundhouse foreman.

"Keep the valves and bearings properly lubricated, as friction results in a fuel loss.

"Take advantage of grades in the operation of locomotives.

"Do not fail to make proper report of mechanical defects on your arrival at terminal, as steam blows from cylinder and valve stem packings, worn-out grates, valves out of square, etc., help to waste fuel.

"Endeavor to work your engine at the shortest practicable cut-off at all times, so as to obtain full benefit of the expansive force of the steam.

"Endeavor to feed the boiler uniformly, and do not allow the water level to rise so high that the effectiveness of the engine or the superheater will be destroyed.

"Avoid slipping your engine. It tears the fire and wastes coal."

The fireman's part is described as follows:

"See that the fire is in proper shape before starting the train. This is the proper time, and not after engine is using steam.

"Do not allow the locomotive to pop unnecessarily; tests show that a pop opened one minute wastes 15 lb. of coal.

"Keep deck and tank clean, and thus prevent coal from dropping off on roadway.

"Close the firedoor after putting in each scoopful of coal.

"Three or four scoops to a fire, even with the largest engines, has been proved practicable and gives the most economical result.

"Avoid bringing in dirty, heavy and dead fires. This results in an excessive amount of good coal being lost at the ash pit. When within a reasonable distance of any terminal fire very light and try to consume only what coal you have in firebox.

"On arrival at the terminal inspect the firebox. If any flues are leaking, ask the engineer to report them at the roundhouse."

Terminal operations play a very important part in the operation of the Delaware & Hudson. The time involved in every terminal movement is accurately checked with a view to reducing the number of idle locomotive hours and the condition of every locomotive is carefully observed with a view to correcting any condition that tends to impair its efficiency. In this connection, the condition of the fire on arrival is given particular attention and all heavy, dirty fires are reported by the hostler. This matter is given special attention, because it is known that heavy, dirty fires indicate inefficiency in operation and increase the time locomotives are held at terminals by delaying the progress of these locomotives over the ash pit.

Departmental Lines Ignored

It will be apparent from the foregoing that the responsibility for fuel economy rests with all departments and on all officials from the general manager down. The following statement by an officer of the company affords a very clear conception of the scope of this work:

"Fuel conservation is in charge of the fuel engineer, who in turn reports to the general fuel agent. Reporting to him is a chief fuel supervisor on each division. To date there have been held on each division 20 meetings. There has

been an average of about 210 items reported per meeting; these items consist of suggestions and corrections reported by the individual committee members. The length of each meeting is from 2½ to 3 hours. Each member is required to fill out a member's report showing what he has personally corrected or had corrected since the previous meeting. This form is shown below; suggestions being made on cards.

"From time to time fuel performance figures are gone over with a view of making comparisons month to month as between divisions and as compared with other railroads with similar operating characteristics. Copies of minutes are distributed to members and such items as require investigation are followed up. The fuel engineer gives periodical talks at roundhouses and shops, also at lodge rooms, on fuel economy and motion pictures dealing with fuel economy have been exhibited.

MEMBERS REPORT TO FUEL CONSERVATION COMMITTEE
..... Meeting Date..... 19..

Mr..... Chairman
Divisional Fuel Committee

Since last meeting of the Committee, I have personally corrected, or had corrected, the following wasteful uses and handling of Railroad Fuel:

.....
Member's Name..... Title.....

This form to be used only for reporting what the Member has individually done in the interest of Fuel Conservation. Every wasteful

use or handling of railroad fuel mentioned on this form should show specifically that the same has been corrected.

If the Member cannot personally correct a wasteful use or practice of Railroad Fuel he should call the same to the attention of the Committee either by letter or by personal report in open meeting of the Committee.

INSTRUCTIONS
(On Reverse Side of Form)

1. Copies of this form are to be kept on hand by the chairman of divisional committees and will be supplied to every member as needed.

2. Every member of every committee is required to make a report on this form, and deliver same to the chairman of the committee at each meeting. If any member has taken no action, sign and send in report and mark it "blank." Have this report ready when the committee meets. Don't wait till the chairman calls upon you, and then have to take time to prepare it.

3. The purpose of this report is to show the progress being made toward fuel conservation and to serve as a record giving credit to members of Committees for their interest and activity. Do not use the report to present matters for the action of the committee. It is intended only to show what the member himself has done to promote Fuel Conservation. Names of persons need not be given. The following will serve as a sample of matters to be reported:

November 1—Saw coaler at overload tank Engine 1026, called his attention to the resultant loss of coal dropped off Engine from such loading. Had coaler shovel coal toward coal gate and cautioned him to be more careful on future loadings.

November 3—While walking through round house at noticed cab aprons and pans on Engine 1032 in very poor condition, which would result in the loss of coal along roadway. Foreman's attention was called and necessary repairs made.

November 7—Noticed hopper car D. & H. 26725 in Mechanicville train at Yard, containing coal, with hopper door partly opened. Car Inspector's attention called and emergency repairs made before car left yard.

4. Every member should be personally active in the interest of Fuel Conservation and turn in a lengthy report at each meeting. Don't think that a shovelful amounts to little, it's the shovelfuls saved that make the tons, so help to save that extra shovelful.

5. When calling attention of a fellow employee to defects or improper use of Railroad Fuel, be sure to speak with the utmost courtesy and consideration. You will do more good in that way and at the same time make friends for yourself and the Fuel Conservation Movement.

THE GENERAL FUEL CONSERVATION COMMITTEE.

Labor Board Summons More Railway Executives

B. M. Jewell Begins Rebuttal in National Agreements Case—Short Line Dispute Dismissed

A REQUEST that W. G. Besler, president of the Central Railroad of New Jersey; E. E. Loomis, president of the Lehigh Valley, and H. E. Byram, president of the Chicago, Milwaukee & St. Paul, be summoned to testify before the Board on April 4 was made on March 24 by Mr. Jewell and granted by the Board several days later. The executives are all former members of the disbanded Labor Committee of the Association of Railway Executives and their cross examination has been requested by the labor leaders as a result of the recent five-day examination of executives described in the *Railway Age* of March 25, (page 803).

B. M. Jewell Begins Rebuttal

The presentation of Mr. Jewell's rebuttal statement to the testimony given on behalf of the carriers by Mr. Whiter began on March 24, Mr. Jewell commencing the reading of approximately 1,000 printed pages of arguments intended to refute the carriers' contentions. Negotiating rules and working agreements on each individual railroad, as proposed by the Railway Executives, would cost the railroad workers more than six million dollars and require the services of more than 5,000 men, Mr. Jewell said in beginning the presentation of the labor side of the case.

He then presented a table giving a complete list of the carriers involved, the number of committeemen required and the daily and total expense for each road.

"For the 107 roads listed," Mr. Jewell said, "the figures show that the services of 5,158 committeemen would be required at a total daily expense of \$65,760 and a total expense for ninety days of \$5,918,442. This sum does not include additional expenses for stenographic work or printing."

"Much of this enormous expense on both railroad management and railroad labor," he continued, "together with the consumption of the highly skilled and essential railroad officials and railroad employees, should be eliminated by co-

operation between railroad management and the 'standard recognized labor organizations, through the creation of a conference committee authorized to represent on the one hand railroad management and on the other railroad employees of the particular crafts. This, we hold, is the procedure that is contemplated in Section 301 of the Transportation Act.'

Regarding the representation of shop crafts employees, Mr. Jewell stated that 95 per cent of the shopmen employed on Class I carriers are members of their respective organizations and that "the federated shop craft organizations on railroads claim the right to represent all of the employees eligible to membership in the respective craft organizations on all railroads, regardless of membership or non-membership, and do not advocate the 'Union Shop' by agreement. In other words, they do not contend that membership, or non-membership in the respective craft organizations shall operate to deny an applicant for employment the right to employment, so long as he has the essential qualifications enabling him to perform the work for which he is making application.

"During the years prior to 1912," Mr. Jewell continued, "there was hardly a period but when some of the members of one or all of the federated shop craft organizations were not on strike, in their efforts to secure from railroad management just and reasonable wages and working conditions. It is significant, however, that since 1912, the date when the railway employees department was organized, there has not been a single authorized strike of federated shop craft employees. It is also significant that during this same period the great progress toward the attainment of just and reasonable wages and working conditions, uniform rules applying alike to all railroads was made.

"This progress, both as to uninterrupted operation of railroads and the securing of just and reasonable wages and working conditions, is due in large measure to the present form of organization and the procedure provided for by the

laws of the railway employees department of the American Federation of Labor and to its members and officers credit is due for this very desirable condition."

Taking up the advantage of a national agreement, Mr. Jewell said:

"As representing the federated shop crafts' employees, we hold that an agreement applying alike to all railroads will be a great, if not the greatest factor, in assisting to establish efficient and economical railroad operation. It will remove the costly 'labor turn-over,' which has always existed to a greater or lesser extent and is due mostly to the fact that wages and conditions of employment on one railroad were more favorable than upon another railroad.

"Management, during the fall of 1917, recognized this condition as a very important factor in computing increased expenses in the operation of railroads, and based their claims for increases in transportation rates to the Interstate Commerce Commission partly upon 'labor turn-over.'"

Mr. Jewell's presentation to the Board will require a week or more, following which the labor side will present numerous exhibits regarding various rules and principles of the national agreement.

Continuing the reading of his rebuttal statement Mr. Jewell cited voluminous correspondence between the railway employees department of the American Federation of Labor and the Railroad Administration leading up to the formation of the shop crafts national agreement. Much of this correspondence dealt with the plans for vocational training for mechanics and apprentices in railroad shops under direction of the Department of Labor.

Board Dismisses Short Line Dispute

The Board's decision on the demand of labor leaders for the application of the rates of pay fixed by Decision No. 2 to employees on the short lines was announced on March 23, although dated March 16. This finding dismissed the dispute because of the Board's inability to determine just and reasonable wages in view of the "varying work done under infinitely varying conditions by the 4,000 employees of the carriers parties to the dispute."

In outlining its position the Board said in part:

To determine just and reasonable wages for any class of employees requires consideration of the work done for such wages. In the present case the work done by each class of short line employees varies to a substantial extent on each carrier. In many instances the work done by any class varies substantially as between the individuals in that class. Thus the determination of just and reasonable wages for any class requires the consideration of innumerable and diverse circumstances and in many instances consideration of the work done by individual employees.

There are wide variations as between these carriers in the cost of living for employees in the communities they serve, in the scales of wages paid for similar work in other industries, in the hazards of the employment, the training and skill required, the degree of responsibility, the character and regularity of the employment, and in other circumstances relevant to a determination of just and reasonable wages.

The Labor Board has found it impracticable to decide on the evidence submitted in this case what are reasonable wages for the varying work done under infinitely varying conditions by the 4,000 employees of the carriers parties to this dispute. Classification of short line employees is necessary for such decision and such classification requires elaborate study. A classification of employees of standard railroads is now in progress. It is practically impossible for this Board to undertake the classification of short line employees while the classification of standard railroad employees is still undetermined.

After ruling out that portion of the controversy relating to national agreements on the ground that this question is now before the Board in another case, the finding says:

Changes are now taking place in the cost of living and in the wage scales paid for similar work in other industries which appear to justify conferences between the carriers parties to this dispute and representatives of their employees. It is the view of this Board that as to the short line carriers such conference would produce more reasonable results than would be accomplished if this Board should now undertake to determine reason-

able wages and working conditions for the employees of the short lines parties to this dispute.

Lest the principles set forth in this finding be taken as an indication of the Board's views regarding the general questions of wages and working conditions, the following paragraph was appended:

This statement is to be understood as applicable to the circumstances of this dispute as to short line employees and not to be taken as indicative of the Board's view as to appropriate action as to conference in another dispute now before it as to rules and working conditions on standard railways.

The Board's decision reads:

For the reasons stated, without prejudice to the right of representatives of employees of said carriers to meet representatives of the carriers or any of them in conference as to wages and working conditions and without prejudice to the right of the parties to such conference to refer any dispute undecided therein to this Board for decision, *these disputes are dismissed*. This decision shall not be considered as affecting any wage increase now in effect nor any agreement regarding wages between any of the carriers and their employees.

Wage Reduction Disputes Come Before Board

The development of paramount interest during the past week has been the initiation of controversies over the wages of employees, particularly of unskilled labor by practically all of the larger carriers. This action is in accord with the recommendations made some time ago by the Association of Railway Executives after their plea for permission to pay unskilled labor the prevailing rates in the territory in which they are employed was denied by the Labor Board. The Board held that any reduction in the wages of unskilled labor could be made only after the negotiations between the carriers and the representatives of the employees, or by the order of the Board after such conferences had ended in disagreement. Changes in the cost of living and wages paid in outside industries have led many carriers to institute controversies over the wages of skilled and unskilled employees.

Some action, either to reduce the wages of unskilled labor or of all employees, has been taken by practically all of the larger carriers throughout the country, and two of these disputes have already been docketed by the Labor Board, the controversy by the New York Central and its unskilled employees being scheduled for hearing before the full Board on March 30, and that between the St. Louis-Southwestern and its unskilled laborers on March 31.

It has been generally supposed that when these cases were brought before the Board it would, in the interest of all concerned, consolidate all of these cases into one hearing on the justness and reasonableness of the rates of pay established by its Decision No. 2 last July. However the docketing of the New York Central and the St. Louis-Southwestern cases indicates that this procedure will not be followed, at least for the present time, and that therefore that settlement of many of the controversies will probably be delayed.

It is significant that the New York Central, in bringing the dispute with its unskilled laborers before the Board, has asked the Board to put a temporary decrease in effect on April 1 and to make the permanent decrease finally decided upon retroactive to that date. It will be recalled in this connection that a similar procedure was followed on behalf of the employees when the Board's decision of July 20 was handed down in that it made the increased rates retroactive to May 1, thus relieving the employees of the financial burden during the progress of the hearings. Similar treatment is now asked on behalf of a carrier and if this request is granted it is not improbable that all of the carriers will be similarly treated and a general wage decrease will be put into effect in the near future, pending the Board's retroactive decision. The Board has also announced that two other hearings involving two other small roads will be held on April 4 and 5. These roads have already reduced wages and the disputes were brought to the Board by the employees.

Dust Explosion Wrecks Large Grain Elevator

**Chicago & North Western Structure at South Chicago Suffers
Enormous Damage from Blast**

AT 6:20 SATURDAY EVENING, March 19, an explosion of dust wrecked the great terminal grain elevator of the Chicago & North Western on the Calumet river in Chicago. The disaster resulted in the death of six persons and a property loss estimated at about \$4,000,000. The structure was leased and operated by the Armour Grain Com-

modating cars on five tracks and surmounted in part by a dryer, a large rectangular structure having a structural steel frame covered by walls of reinforced stucco or "gunite." The walls of the galleries and cupolas above the bins were composed of the same material while the roof consisted of thin concrete slabs covered with a suitable roofing.



Photos—Left, Underwood & Underwood; right, International!

The Wrecked Track Shed

The River House, and the Frame of the Marine Leg

pany and was one of the largest plants of its kind in the world.

This grain elevator, which represents an investment of about \$10,000,000, was composed of a storage house, a work house and a "river house," each consisting essentially of concrete bins of the usual construction with a storage capacity of 6,000,000 bu. and surmounted by superstructures or galleries and cupolas, which in the case of the work house and the river house extended to a height of approximately 200 ft. above the track level. The work house, which consisted of 95 bins, was flanked on the west by a track shed accom-

The Work House and the Twisted Frame of the Dryer

The Broken Corner of the Storage House

All evidence now available indicates that the explosion consisted of the progressive ignition of an explosive mixture of dust and air filling practically all of the enclosed spaces in the structure which were not occupied by the grain. The greatest intensity of the explosion was apparently in the two cupolas over the work house and river house, respectively, and in the galleries over the storage bins, the effect being to burst off all of the gunite walls and concrete roofing from the steel frame which was left in a more or less distorted and otherwise damaged condition. The fragments of wall and roofing construction were blown to great distances from

the elevator and this material, falling from a great height on the roofs of the power plant, office building and other auxiliary structures, crushed in their roofs and otherwise seriously damaged them. The dryer structure was torn from its supports against the side of the work house bins and fell on the track shed which was completely wrecked, crushing 20 cars which were in the shed at the time or causing them to be thrown into the pit or track hopper below the tracks.

A superficial examination also indicates serious injury to the concrete bin structures. Fifteen of the bins at the southeast corner of the storage group collapsed completely, allowing the grain to run on to the ground, as shown in one of the photographs. The outer walls of many of the remaining exterior bins are also badly split or cracked, both horizontally and vertically. The condition of the interior walls cannot be determined until the grain now in many of these bins has been removed.

A number of small fires were started by the blast of the explosion but these were readily extinguished by firemen shortly after the accident. There has been some indication of smoldering fires in the grain but apparently very little of the damage has resulted from fire.

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. FOR WEEK ENDED SATURDAY, MARCH 12, 1921

Districts	Year	Total revenue freight loaded								Received from connections			
		Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L.	Miscellaneous	This year	Corresponding year 1921	Corresponding year 1920	Corresponding year 1919
Eastern	1921	5,851	2,438	39,651	851	6,600	903	51,184	57,458	164,936	.....	189,913	.....
	1920	5,590	2,799	48,871	3,629	5,499	3,356	33,105	89,836	192,685	169,889	215,418	187,395
Allegheny	1921	2,164	3,111	42,586	4,365	3,085	1,592	39,954	46,063	142,920	.....	95,675	.....
	1920	2,447	2,928	52,537	3,401	3,713	3,187	42,341	66,247	176,801	141,338	126,194	114,058
Pocahontas	1921	157	75	13,334	53	1,467	10	2,541	5,349	22,986	.....	12,655	.....
	1920	158	77	19,949	757	2,019	310	160	10,181	.....	33,611	27,525	17,902
Southern	1921	3,431	2,090	18,438	571	14,213	938	39,713	35,528	114,922	.....	62,508	.....
	1920	2,945	2,348	23,496	135	18,054	2,653	21,058	55,613	126,302	111,318	78,398	64,089
Northwestern	1921	10,574	8,582	5,017	1,010	17,698	1,044	25,809	29,204	98,938	.....	45,774	.....
	1920	9,455	7,690	10,060	1,306	20,979	1,392	21,637	40,254	.....	112,773	109,606	57,116
Central Western	1921	11,164	9,839	13,655	159	3,238	1,945	29,553	30,741	100,294	.....	47,708	.....
	1920	8,286	9,843	23,185	407	6,035	2,815	22,957	41,501	.....	115,029	95,344	67,462
South Western	1921	4,555	1,712	3,416	94	6,183	432	16,580	24,100	57,072	.....	40,355	.....
	1920	3,840	2,424	6,710	162	6,974	891	16,432	24,695	.....	62,128	46,246	51,601
Total all roads	1921	37,896	27,847	136,097	7,103	52,484	6,864	205,334	228,443	702,068	.....	494,588	.....
	1920	32,721	28,109	184,808	9,797	63,273	14,604	157,690	238,327	.....	819,329	.....	614,091
	1919	36,373	29,557	141,939	....	57,086	15,527	.....	420,784	.....	701,266	.....	522,988
Increase Compared	1920	5,175	....	48,711	2,694	10,789	7,740	47,644	99,884	117,261	.....	119,503	.....
Decrease Compared	1920	....	262	48,711	2,694	10,789	7,740	205,334	802	.....	.....	.....	.....
Increase Compared	1919	1,523	....	7,103	....	4,602	8,663	192,341	.....	.....	28,400	.....	.....
Decrease Compared	1919	....	1,710	5,842	....	8,663	....	.....	.....	.....	.....	.....	.....
L. C. L. Merchandise loading figures for 1921 and 1920 are not comparable, as some roads are not able to separate their L. C. L. freight and miscellaneous of 1920. Add merchandise and miscellaneous columns to get a fair comparison.													
March 5	1921	41,936	28,257	143,436	7,828	52,216	7,315	201,068	230,826	712,882	811,106	675,270	495,599
February 26	1921	41,218	26,885	142,226	8,109	51,257	7,196	173,678	207,653	658,222	783,295	666,708	448,343
February 19	1921	36,059	27,892	146,438	8,735	54,417	11,702	187,064	223,199	695,506	772,102	700,913	471,877
February 12	1921	32,879	27,456	151,786	9,026	53,882	8,094	184,892	213,612	681,627	786,633	687,128	488,983

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. FOR WEEK ENDED SATURDAY, MARCH 19, 1921

Districts	Year	Total revenue freight loaded								Received from connections			
		Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Merchandise L. C. L.	Miscellaneous	This year	Corresponding year 1921	Corresponding year 1920	Corresponding year 1919
Eastern	1921	5,384	2,548	35,647	795	6,379	849	52,535	59,563	163,700	.....	188,726	.....
	1920	5,584	2,980	47,695	4,347	7,518	3,532	38,324	97,851	207,831	163,375	246,511	186,549
Allegheny	1921	2,279	2,716	37,932	3,463	2,401	1,152	40,305	47,059	137,307	.....	94,866	.....
	1920	2,787	3,216	50,380	4,686	3,543	4,122	43,064	71,339	183,137	143,694	128,881	110,956
Pocahontas	1921	157	61	13,504	36	1,529	11	2,636	5,579	23,513	.....	12,529	.....
	1920	140	66	20,681	749	2,045	275	145	10,225	.....	34,326	30,035	17,710
Southern	1921	3,241	1,804	17,642	568	13,624	728	39,070	37,540	114,217	.....	63,083	.....
	1920	3,302	2,053	24,417	145	17,727	2,355	25,173	55,628	.....	130,800	118,930	80,745
Northwestern	1921	10,407	7,634	4,969	961	16,458	1,046	26,872	27,909	96,256	.....	44,085	.....
	1920	9,534	7,690	9,191	1,220	21,616	1,878	21,602	41,008	.....	113,733	106,114	58,883
Central Western	1921	9,962	9,694	12,750	157	3,259	1,782	30,503	30,443	98,550	.....	46,788	47,749
	1920	7,987	10,867	21,740	455	6,315	2,967	23,656	45,763	.....	119,750	90,547	66,812
Southwestern	1921	4,608	1,966	3,637	142	6,415	480	16,895	24,021	58,164	.....	40,861	.....
	1920	3,443	2,494	7,851	141	7,504	851	16,666	26,527	63,477	47,025	52,758	38,106
Total all roads	1921	36,038	26,423	126,081	6,122	50,065	6,048	208,816	232,114	691,707	.....	490,938	.....
	1920	32,777	29,366	181,955	11,743	66,268	15,980	168,630	234,341	.....	855,060	.....	652,300
	1919	35,240	31,032	133,719	....	56,729	15,287	40,186	427,713	.....	699,720	.....	515,212
Increase compared	1920	3,261	....	5,621	16,203	9,932	....	116,227	163,353	.....	.....	161,362	.....
Decrease compared	1920	....	2,943	55,874	6,122	....	268,816	195,599	8,013	.....	.....	24,274	.....
Increase compared	1919	798	....	7,638	....	6,664	9,239	....	247,713	.....	699,720	.....	515,212
Decrease compared	1919	....	4,609	....	8,735	11,702	187,064	223,199	695,506	772,102	700,913	471,877	579,452
L.C.L. merchandise loading figures for 1921 and 1920 are not comparable as some roads are not able to separate their L.C.L. freight and miscellaneous of 1920. Add merchandise and miscellaneous columns to get a fair comparison.													
March 12, 1921	....	37,896	27,847	136,097	7,103	52,484	6,864	205,334	228,443	702,068	819,329	701,266	494,588
March 5, 1921	....	41,936	28,257	143,436	7,828	52,216	7,315	201,068	230,826	712,882	811,106	675,270	495,599
February 26, 1921	....	41,218	26,885	142,226	8,109	51,257	7,196	173,678	207,653	658,222	783,295	666,708	448,343
February 19, 1921	....	36,059	27,892	146,438	8,735	54,417	11,702	187,064	223,199	695,506	772,102	700,913	471,877

Freight Car Loading

WASHINGTON, D. C.

REIGHT CAR LOADING, which during the first two weeks of March had shown a slight gain, was again reduced during the week ending March 19 to lower figures than had been recorded since the first of the year, with the exception of one week containing a holiday and one other week in February. According to the weekly report of the Car Service Division of the American Railway Association, the number of cars loaded with revenue freight for the week was 691,707, as compared with 702,068 the week before and with 855,060 in the corresponding week of 1920 and 699,720 in 1919. The car loading figures have been following closely the curve shown on the chart for 1919 and for two weeks had shown a slight gain over 1919 but for the week of March 19 they again fell below 1919. The loading of all classes of commodities showed a decrease as compared with the previous week except merchandise, l.c.l., and miscellaneous freight, which amounted to 440,920 cars, a gain of 7,000 cars. There was a gain, however, as compared with 1920 in the loading of grain and grain products, which for the week

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amounted to 36,038 cars. The largest decrease was in the loading of coal, 126,081 cars, a decrease of 60,000 as compared with 1920 and of 10,000 cars as compared with the previous week. The summary for the week of March 12 is shown in the table on the preceding page.

The freight car surplus for the week ending March 23 was the largest ever recorded in the history of the railroads, the daily average for the week being 459,411, of which 230,394 were coal cars and 164,195 were box cars. The largest previous surplus was in February, 1919, when it was about 451,000. In 1908 there was a surplus of about 413,000.

The increase in the number of surplus cars and the reduction in car loading is largely attributable to the rapid falling off of the coal movement. The coal car loading during the week of March 19 was 64,000 cars less than during the first week in January. Loading of merchandise and miscellaneous freight was increased during that time by 61,000 cars.

President Takes Up Railroad Wage and Rate Situation

WASHINGTON, D. C.

PRESIDENT HARDING has decided to take a hand in trying to find a solution for the difficult railroad situation. Following the cabinet meeting on Tuesday, at which the railroad situation and its effect on the business of the country was the principal subject of discussion, the President announced that he would confer on the subject at an early date with Chairman Clark of the Interstate Commerce Commission and Chairman Barton of the Railroad Labor Board. Chairman Barton arrived in Washington from Chicago on Thursday morning and shortly afterward, with Chairman Clark, went into conference with the President.

The President has expressed his deep concern in the situation and desires to do anything necessary or possible to bring relief. He has been informed that most of the railroads are not earning their operating expenses, under rates designed to give a 6 per cent net return, and that the situation has been made much worse by the large falling off in the volume of freight movement, which some of his advisers are inclined to attribute largely to the rate level. He has not publicly indicated that he has any plan in mind other than to get information from Messrs. Clark and Barton as to the questions involved in the rate and wage situations from their respective points of view, but the fact that they were considered together is taken as an indication of an appreciation of the dependence of the possibility of rate reductions on the largest item in the cost of transportation.

Most of the members of the cabinet who discussed the matter are interested in the subject from the standpoint of rates and their effect on business rather than the causes for the high rates, and it is understood that the President has been informed by railroad executives that rates are so high as to interfere in many instances with the free movement of traffic, but they have naturally emphasized the necessity for reducing wages before much can be done in the way of rate reductions. There have been predictions by the newspaper correspondents that the President would discuss the railroad question in his message to Congress, although some of his closest advisers on the subject, including Senator Cummins, have taken the position that legislation is not needed so much as the application of ordinary business principles.

"The whole question is one of operating costs," said Senator Cummins in a newspaper interview. "Rates cannot go higher. Railroad revenues last year were the greatest in the history of the railroads and they handled the greatest volume of traffic and the largest number of passengers in their history. The expense account is too big. It will be the purpose of our committee's investigation to find out where the trouble

lies. The reduction should not be limited to labor. It should apply to the whole structure. I do not see that we can do much in the matter of additional legislation. In my opinion it is impossible to make any material increase in the power of the Interstate Commerce Commission without bringing about government instead of private operation."

It is believed that Chairman Clark will tell the President that rates in general cannot be materially reduced until there has been a reduction in the cost of rendering the service. He expressed this opinion recently in a letter to Senator Harris of Georgia, in which he said: "Under these circumstances it is difficult to find an argument in favor of reducing rates unless in instances in which it can be shown that rates are stifling the traffic and that lower rates, which would still be compensatory, would effect a movement from which there would be some return."

If Chairman Clark should adhere to this position in talking to the President, the question as to what can be done in the way of reducing expenses as promptly as possible would naturally follow and Chairman Barton might be asked as to whether his board can expedite a determination of the wage issue. Railroad executives who have been in conference with Senator Cummins and other representatives of the administration have expressed the opinion that there should be a considerable reduction this year in the railroad fuel bill and they have also expressed confidence in their ability to bring about other economies, but no economies large enough to save the situation can be made without reducing the payroll.

The President will have an opportunity, if he desires to do so, to exert some influence on the complexion of the Railroad Labor Board when he comes to appoint successors to the three members of the board whose terms expire in April. The members of the railroad and labor groups, under the law, are to be selected from nominations made by the railroad executives and by the labor unions, so the President will not have a very wide range of choice as to two of the appointments and may reappoint the present members, W. L. Park and J. J. Forrester, but the three members of the public group hold the balance of power on the Board, and it is regarded as likely that the President will prefer to make his own selection for the new appointment in that group rather than reappoint President Wilson's selection, Henry T. Hunt, a Democrat. It is understood that Mr. Hunt has been inclined to side with members of the labor group on the Board more often than with the railroad representatives.

A good many prominent railroad officers have been in Washington recently and many of them have undoubtedly found ways of getting information to the ear of the President. Herbert Hoover, A. W. Mellon and Henry C. Wallace of the cabinet are also especially concerned with railroad matters. The railroads are not asking for any new legislation nor are they asking the government to do anything affirmatively for them at this time except that they are trying to collect as much cash as possible on account of their guaranty for the period of federal control and for the six months following it, as cash is their most pressing immediate requirement. Just now faster progress is being made in realizing on the six months' guaranty than in effecting settlements with the Railroad Administration for the earlier period. Up to March 28 the Interstate Commerce Commission had certified and the Treasury had paid \$97,322,990 in partial payments to 42 roads on account of the guaranty under the authority of the Winslow law, in addition to \$263,000,000 previously advanced, but some large sums are still tied up in the accounts with the Railroad Administration which the latter has been withholding pending a final adjustment. Some roads have had to borrow from the Railroad Administration and give collateral for money due on account of their compensation. Also some roads to whom sums are due on account of the six months' guaranty are still negotiating with the commission.

Duplex Compensating Suspension Applied to Baker Tractors and Trucks

THE BAKER R & L COMPANY, Cleveland, Ohio, announces its new series C models of electric industrial tractors and trucks replacing the series B machines produced during the past three and one-half years. An important feature of the new machines is the ingenious manner in which the heavy thrusts of the axle and the driving and braking strains

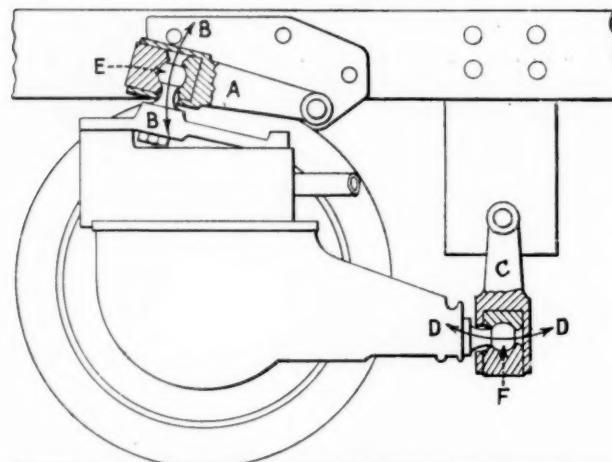


Fig. 1.—Line Drawing of Duplex Compensating Suspension

are resisted through what is known as the duplex compensating suspension. This suspension resists all torque and driving strain, provides for free spring action and maintains accurate alignment at all times between the axle and the frame.

Referring to Fig. 1, it will be seen that the axle is suspended by means of two V-shaped yokes through large ball and socket joints on the axle and trunnion bearings on the

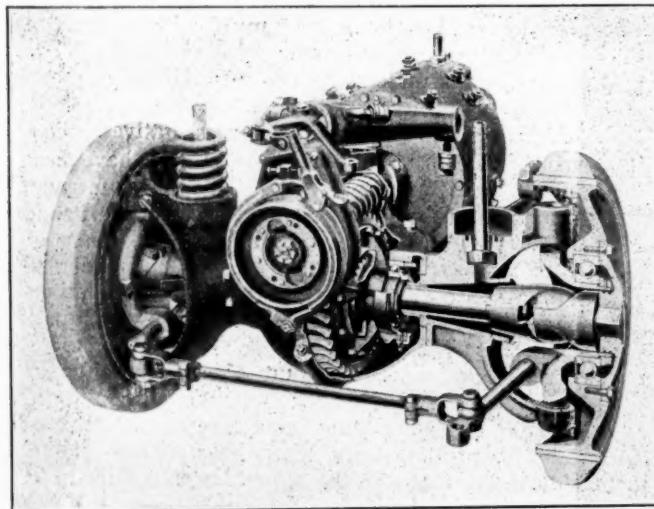


Fig. 2.—Driving Axle of Baker Truck Equipped with Duplex Compensating Suspension

truck frame. The horizontal or driving yoke *A* transmits the driving power from the axle to the frame while the vertical or torque yoke *C* resists "torque" or the tendency of the axle to rotate and also has a slight forward and backward motion when compensating for the angular movement of the driving yoke.

The double concentric helical springs support only the truck load. They are loosely seated in the frame and axle

members which are tied together against rebound with spring bolts, swiveling in their sockets. The flexibility provided by this construction permits the driving axle to negotiate either smooth or rough road surfaces, increasing traction without loss of efficiency or clamping or binding of the parts. Of equal importance is the elimination of maintenance expense, looseness and rattling when torque reactions are taken through sliding surfaces used in conventional constructions. The large lubricated trunnion bearings and adjustable ball and socket joints insure durability of parts for the life of the machine. A phantom view of the mechanism is shown in Fig. 2.

Emphasis is laid on the importance of the duplex compensating suspension because machines of the industrial truck type are subjected to extremely severe torque stresses. Although operated at slow speed they are frequently bumped into heavy objects and throughout their life must resist the strains coming from abrupt starting and stopping. In fact, many operators change abruptly from full speed ahead to full

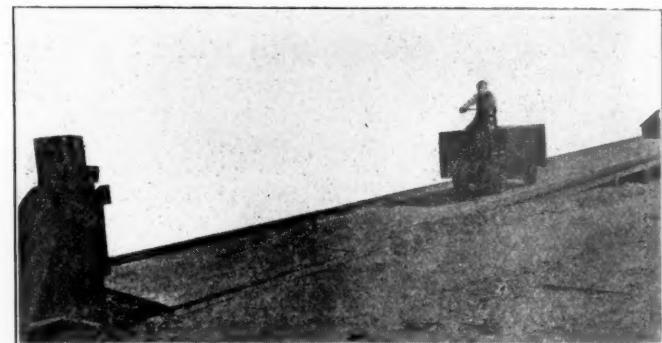


Fig. 3.—View Showing Method of Making Impact Tests

speed reverse, subjecting the machine to heavier strains than are encountered in other vehicle work.

Sample machines incorporating this new feature were subjected to unusual tests of a spectacular nature and stood up satisfactorily under strains which would easily have caused failure to trucks equipped with a less rugged, yet flexible type of spring suspension. In one of the tests a tractor equipped with duplex compensating suspension, was operated down a 12½ per cent ramp at 10 miles per hour as shown in Fig. 3. The tractor struck a blow of 46 tons against the bumping post without damage to the spring suspension or other parts.

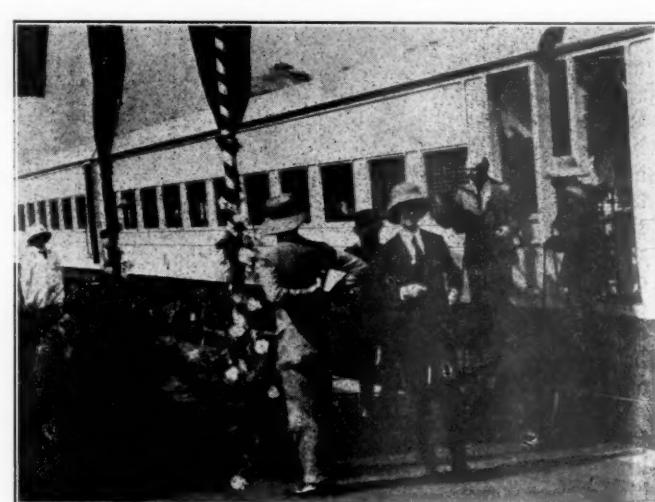


Photo by International

A Passenger Train at Gondia, India

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Railway Business Association's Annual Meeting

Equipment Policies and Stability of Purchases Dismissed. Dinner Addressed by Willard and Clark

THE ANNUAL MEETING of the Railway Business Association at the Waldorf-Astoria Hotel, New York, on March 31 marked the completion of one of the most successful years in the history of that organization, not only from the standpoint of the work done during the year, but also from that of the increase in the membership.

The meeting, following the usual custom, took place in the morning, at which time the committee reports were presented, and resolutions adopted. The annual dinner was addressed by Daniel Willard, president of the Baltimore & Ohio and chairman of the American Railway Association, and by Edgar E. Clark, chairman of the Interstate Commerce Commission. Mr. Clark came to the dinner direct from the conference with President Harding and Chairman Barton, of the Railroad Labor Board, held in Washington to discuss the present railway situation.

The feature of the annual meeting was the presentation of two reports, one by the Committee on Equipment Policies,

and the other by the Committee on Stability of Railway Purchases, both of which were adopted without discussion. They are reproduced below.

The report of the General Executive Committee reviewed the work of the year, and pointed out wherein the association had enlarged its activities. Particular reference was made to the action taken by the organization in favor of the Winslow bill, passed recently, to permit partial payments of the Government guaranty to the railroads; to a circular issued recently opposing decreased rates without decreased operating costs; to the work of the Committee on Stability of Railway Purchases, etc.

A report of the field manager showed that the organization in 1920 increased its membership by about 88 per cent, and by about 70 per cent more companies. This does not include new members secured since the first of this year. The membership at present is about 700; in 1919 it was less than 350.

Report of Committee on Equipment Policies

THE REPORT of the Committee on Equipment Policies, E. B. Leigh, president of the Chicago Railway Equipment Company, chairman, was in the form of a suggestion that the Railway Business Association take up with the Interstate Commerce Commission the question of its attitude or policies as to new devices, etc., which may be offered to the Commission for government test. Particular reference was made to automatic train stop and train control devices. With the report was a letter addressed to Edgar E. Clark, chairman of the Interstate Commerce Commission, by Alba B. Johnson, president of the Association, taking up the question and offering the assistance of the Association.

The report follows:

Your Committee on Equipment Policies recommends that an inquiry be addressed to the Interstate Commerce Commission regarding certain aspects of the policy which that body is preparing, through the Bureau of Safety, to adopt toward automatic train-stop and train-control devices. The inquiry, which we hope will be considered before a policy is determined, is whether or not the individual railway will retain freedom to install without government test or previous government approval such devices as in the judgment of the road will meet the government requirements, leaving it for the Interstate Commerce Commission to inspect operation, to decide whether the requirements have actually been fulfilled and if not to act accordingly.

The jurisdiction of this Committee embraces every field in which the Interstate Commerce Commission under the law has authority or duty to exert an influence upon the character of railway facilities. In a previous report we summarized the provisions of the Transportation Act, 1920, which bestow such authority or impose such duties. In that report we said: "In due course the Interstate Commerce Commission in its dealings with the railways will be confronted in this field by concrete situations which will require it to proceed in accordance with some general policy." Discussing specifically safety appliances we said: "We believe the Commission will have solidly behind it the best informed part of the public if that body adheres to its traditional program of regulation without undertaking management. . . . The concern of the Commission if it adopted this policy would be not what the appliance is but what it does."

Train Control Typical

Since that report was made your Committee has caused the course of events to be observed. The only field in which we understand that the formulation of a policy has since been undertaken is that of automatic train stops and train-control devices. The principle involved is identical with that involved in the determination of policy affecting every other kind of railway facilities over which the Commission has or may acquire jurisdiction. Whatever is determined in respect to automatic train control will establish a precedent of principle to be applied in due course to every facility upon whose character the Commission exercises an influence. All our members are therefore interested.

The Transportation Act, 1920, provides that with two years' notice the Commission may order a carrier "to install automatic train control had been made under the auspices devices which comply with specifications and requirements prescribed by the Commission." Previous to that Act an investigation covering several years into the feasibility of automatic train control has been made under the auspices of the Commission. After the new Act went into effect committees were formed by the Bureau of Safety and the American Railway Association and have labored jointly upon definition of tests. They have visited manufacturing and demonstration plants. On Feb. 15 the joint board made the following announcement:

Official Announcement

"The functions to be accomplished and the specifications and requirements to which a device to be installed in any designated location must conform will of necessity be determined by traffic, operating and other local conditions and can be prescribed in detail only when the specific location for an installation has been designated. In connection with the test installations now in contemplation, it may be necessary to establish specifications and requirements merely tentative at the outset and subject to modification and development as the work progresses. Such specifications and requirements for several test installations, together with records of alterations in the installations which may become necessary in the course of the tests, would furnish data from which the Commission may ultimately prepare specifications and require-

ments to be prescribed in accordance with the terms of the law."

On the same date the joint board adopted a tentative statement of the performance which should be expected of a system in stopping trains or in controlling their speed. More than 300 concerns and individuals have registered their desire to have appliances considered. Many of these the Bureau of Safety has reported to be without merit. There are some signs that the time may be approaching when the Interstate Commerce Commission will be called upon to determine whether or not practice on the several roads is in accordance with the Act.

Considerations

Following are some of the considerations which have been laid before your Committee:

1. Practical conditions preclude tests by the Commission of all appliances offered.

The cost of testing out hundreds of different devices under service conditions within a reasonable time would be prohibitive even if experts could be assembled in sufficient numbers to do the work.

2. If not all the devices offered could be tested the Commission would have to choose arbitrarily which it would admit.

If a device can only be tried by the government there will be many which cannot be tried at all. Through overlooking what might prove feasible or might lead up to something feasible if tried, valuable advances may be lost and, more important and far-reaching than this, inventive effort may be discouraged. Mechanical progress not alone in safety but in economy and efficiency has been attained by leaving each of the railroads free to try such appliances as it thinks promising.

3. The Commission is under no obligation either of law or of custom to make government tests a pre-requisite for railway installations.

The law gives the Commission authority to order a railroad to install devices "which comply with specifications and requirements prescribed by the Commission." If so interpreted by the Commission this might mean the specifications and requirements could be so drawn as to exclude every device save one; but the Commission is under no compulsion so to interpret it. The bestowal of discretion is obvious.

What Is Wise?

The question is, *What is wise?* As to custom, the railroads install, for example, locomotives with such boiler and safety appurtenances as they deem prudent and Bureau inspectors notify them when the requisite performance is not attained and prescribe what the railways shall do to meet government requirements. The same thing is true as to safety appliances on cars or track.

In other words, the train-stop and train-control provisions empower the Commission to order such devices, meeting certain stipulated requirements, and to compel observance of its order, all of which it can do if it so elects without forbidding one device or insisting upon the trial or use of another. If this policy were adopted each railroad would retain the freedom it has heretofore had of trying on its own initiative such devices and systems as it may deem promising while remain-

ing responsible for fully complying with the specification and requirements officially promulgated under the law.

Your Committee recommends that this report be transmitted to the Commission with the inquiry whether the official purpose has been defined and whether there is such diversity of view that our Association might with advantage to the federal authorities participate in a hearing or conference.

The members of the Committee on Equipment Policies are as follows:

E. B. Leigh, Chicago, Chairman, president Chicago Railway Equipment Co.

H. F. Ball, New York, president Franklin Railway Supply Co.

W. S. Bartholomew, Pittsburgh, president Locomotive Stoker Co.

F. W. Edmunds, New York, east sales mgr., Sunbeam Electric Mfg. Co.

Frank L. Fay, Greenville, president Greenville Steel Car Co.

A. C. Moore, Chicago, assistant to president Globe Seamless Steel Tubes Co.

H. M. Pflager, St. Louis, vice-president Commonwealth Steel Co.

A. G. Wellington, Baltimore, vice-president Maryland Car Wheel Works.

W. H. Woodin, New York, president American Car & Foundry Co.

Letter to Interstate Commerce Commission

The letter addressed to Chairman Clark said:

By request of our Committee on Equipment Policies I transmit herewith a letter addressed to me by its chairman, E. B. Leigh.

The general scope within which this inquiry falls includes all aspects in which the Commission has statutory authority to exercise an influence over the character of railway facilities. The particular illustration here discussed, automatic train control, is understood to be within the special jurisdiction of the Bureau of Safety. We presume, however, that the Commission will consider other illustrations together with this in approving the course to be pursued in developing a policy; hence this communication is addressed to the Commission through you.

Your attention is requested to certain phases of the interrogatory:

1. As developers of progressive mechanical appliances and purveyors of competing devices and materials, our members have special knowledge and experience which we think should give their conclusions weight and can perform their services to transportation more effectively if the policy of the Commission takes those conclusions into account.

2. Automatic train control is merely typical. The policy adopted with regard to this will necessarily forecast future action touching other facilities. Hence all our members, whatever the character of their products, are interested in the train-control precedent.

3. Participation by developers and makers of appliances in the discussion of policy will be actual only if their point of view is known to the authorities before the official conclusion is put in effect.

The questions which our Committee propounds are these:

A. Has the official purpose governing automatic train control and stop appliance requirements been defined?

B. Is it contemplated that the individual railway will retain freedom to install without government test or previous government approval such devices as in the judgment of the road will meet the government requirements, leaving it for the Interstate Commerce Commission to inspect operation, to decide whether the requirements have actually been fulfilled and if not to act accordingly?

C. Is there such diversity of view as to policy in this matter that our Association might with advantage to the federal authorities participate in a hearing or conference?

Stability of Railway Purchases

THE REPORT of the Committee on Stability of Railway Purchases, S. P. Bush, president and general manager of the Buckeye Steel Castings Company, chairman, took the form of a communication to Herbert Hoover, Secretary of Commerce.

The report said:

Responsive to a resolution of the general executive com-

mittee, the chairman of the Committee on Stability of Railway Purchases, with the co-operation of the president and secretary, is engaged in the serial publication of leaflets upon various aspects of the subject as set forth in its January report. The first leaflet, with charts, was "The Next Step Toward Preventing Depressions" (abstracted in the *Railway Age* of January 7, 1921). Herewith is presented the second.

which is intended to combine action with discussion. Its text is a request to Secretary of Commerce Hoover for a conference upon industrial and commercial prosperity and stability.

Letter to Secretary Hoover

The Railway Business Association, comprising several hundred concerns which have goods or services for sale to railways, welcomes the opportunity for co-operation afforded by your recent utterances on industrial and commercial stability.

Other groups besides ourselves have distinct special interests parallel to ours. These include all whose customers are institutions requiring very large amounts of machinery, material and supplies. So-called public utilities are among the number. A vast buying power is that of governmental units, city, county, state and federal. Stability of purchases is important to all concerns which sell goods or services to any of these. With all such concerns our Committee on Stability is ready to work for the common end. All of them are invited to aid us in our discussion of railway buying. To all these groups everyone everywhere whose wages depend upon general prosperity can profitably accord full sympathy and help. This project is everybody's affair.

We request a conference with you upon the opportunities and responsibilities which the present situation gives to all concerned and upon ways and means for restoring prosperity and promoting stability hereafter. The possibilities of your leadership cannot be measured.

As we view it, the course desirable for large purchasing institutions to pursue in the months immediately in front of us has two aspects: (1) to prove their faith in the national future to the limit of their resources; (2) to lay foundations now, when unemployment disposes citizens to listen, for systematic accumulation of such resources in busy years to be used in dull years.

Our proposal is no more than merely sound business policy. Whatever must be bought, whether machinery, materials or labor, by a city, a county, a state, the United States, a public utility or a railroad can be obtained most economically when general business is depressed. Large buying at such a time mitigates unemployment of labor and commercial distress. Instead of being idle a large part of the time and at other times overtaxed, the men, the buildings, the machines, all the accessories of supply, including transportation facilities, are kept steadily busy; not so much plant and overhead is required, while the personnel escapes periods of acute privation.

In government works this principle has long been discussed and has begun to be applied. The Commonwealth of Pennsylvania by law binds itself to that policy. The legislature in 1917 created an Emergency Public Works Commission, who were made custodians of a fund to be accumulated by successive legislative appropriations during good times and spent during other times on public works. When demobilization of the army came in 1919 the proceeds of a bond issue and a special appropriation were supplemented by the beginnings of such an accumulated fund. When the soldiers came back Pennsylvania did more on public works than in any previous year. Other cities, counties and states made special arrangements to intensify public construction in 1919 and appreciably helped minimize distress of unemployed soldiers in the transition from war to peace. The distinctive feature of the Pennsylvania state policy is deliberate financial provision in advance. A certain specified amount is annually raised, put aside and ear-marked for expenditure in an emergency.

Some famous railway presidents have made history by a similar practice. Two most often cited are A. J. Cassatt and E. H. Harriman. A familiar anecdote tells of the consternation with which some of the Pennsylvania Railroad directors heard Mr. Cassatt propose in time of depression an expenditure of many millions for intensive development of the property and his serene inquiry at what time such expenditures would buy more material or labor or interfere less with the company's merchandise traffic. Mr. Harriman with the Union Pacific was noted as a thrifty, courageous and confirmed seeker of bargains. The Santa Fe and other railways have pursued a similar course.

Adoption of such a policy and adherence to it by railroads cannot wisely or effectively be forced by government requirement. It is one thing to command a railroad to possess a given surplus and quite a different thing for the railroad to obtain such a sur-

plus or to make it, if possessed, tide over a slump the continuance of which is any man's guess. Vice-president E. J. Engel of the Santa Fe in a letter favoring purchases in time of light traffic tells us some of the limitations. Mr. Engel says, "No one can tell how long the period will last, and there is a risk of having to carry the materials for a very long time before they can be used, with consequent carrying charges under adverse conditions, and many other points to consider; so that no railway company can establish a fixed policy and each must decide as occasion arises what will best meet its conditions."

Judgment how long a depression is going to last must of course weigh conclusively with every railroad directorate in deciding how far it is necessary to husband its surplus for interest and for dividends stabilized at a figure deliberately made moderate in busy years in order to avoid its interruption when income sags. Vice-president A. J. County of the Pennsylvania points out that Mr. Cassatt's "big program and large expenditures did not occur in a period of heavy traffic losses, but only after the certainty that the bottom had been reached and that business was on the upturn and would certainly require the new tracks, facilities and equipment, revisions of grade and alignment."

We must here condense in a paragraph the momentous suggestion that if purchases of the great buyers were stabilized as proposed this itself would constitute what our committee recently set forth under the title, "The Next Step Toward Preventing Depression." Once the railroads, utilities and governments had put in operation a policy of accumulating resources for the period of acute adversity they would have come near postponing that time to the day after never. We have established a Federal Reserve system. We have practically eliminated crop failures. If now large purchasers can provide themselves with emergency funds and credits they themselves can do much to stop depression when incipient by coming into the market. Especially will they mitigate the commercial failures which result from violent fluctuations in demand for commodities and plant and hence in values. Whatever large buyers do in this direction will tend to weaken the force of industrial convulsions and to shorten their duration.

Business at this moment appears to be mending. Serious problems face us, particularly that of foreign markets, which restrict the outlet for agricultural and manufactured products. But your own grasp of that situation underwrites the prosecution of every proper available measure for our relief and that of our neighbors abroad; and already failures are less and car loading larger. This last means increased gross earnings for the railways, and with completion of the labor liquidation now in process should in due course bring more satisfactory net railway income.

For the conference which we request the following topics are suggested:

1. What co-operation among various business interests and with the government is desirable to effect such adjustments and arrangements as will permit and induce without loss of time reasonable activity of purchasing power and of production?
2. What co-operation of interests is desirable with a view to the continuous adjustment of railway earnings, expenses and net income to a basis which will permit accumulation of funds for economical expenditure in dull years?
3. How may each large buyer be systematically advised of the methods pursued and the advantages realized by those who purchase heavily in depressions?
4. How may the several elements variously interested in stability of large purchases best reach and maintain an understanding of one another's problems and related problems of government?
5. How may signs of returning prosperity be observed and widely reported for the information of large buyers whose responsibility it is to judge the probable duration of depressions?

S. P. BUSH, Chairman.

The membership of the Committee on Stability of Railway Purchases is as follows:

S. P. Bush, Columbus, Ohio, Chairman, president and general manager Buckeye Steel Castings Co.; John K. Broderick, St. Louis, president Broderick & Bascom Rope Co.; Frank G. Echols, Greenfield, Mass., president Greenfield Tap & Die Corp.; J. M. Gillespie, Pittsburgh, vice-president Lockhart Iron & Steel Co.; R. W. Gillispie, S. Bethlehem, Pa., assistant general sales agent, Bethlehem Steel Co.; Grafton Greenough, Philadelphia, vice-president Baldwin Locomotive Works; Clarence H. Howard, St. Louis, president Commonwealth Steel Co.; N. S. Reeder, New York, vice-president Pressed Steel Car Co.; Charles R. Robinson, Buffalo, vice-president Lackawanna Steel Co.; Wm. E. Sharp, Chicago, president Grip Nut Co.; Alex. M. Stewart, New York, president James Stewart & Co., Inc.; E. M. Zehnder, Scranton Pa., president Scranton Bolt & Nut Co.

Resolutions

The meeting expressed its attitude towards the present problems of the railroads in the following resolutions:

I.

We witness the high standard of performance established by the Interstate Commerce Commission in its administration of the Transportation Act, 1920. The Commission has functioned with wisdom, courage and energy.

II.

We regard the very small net earnings, and in many cases deficits of the railroads at this time, and for several months past, as seriously inimical to the economic welfare of our transportation system and of the country at large.

We recognize that further advances in transportation rates are impracticable, and that a reduction thereof, as soon as possible, is imperative.

We, therefore, urge the vital necessity of prompt reductions in railroad operating costs which includes, of course, costs and prices in private industry essential thereto.

III.

The Interstate Commerce Commission on March 1, 1922, under the statute, acquired authority to fix from time to time the rate of return upon railway property which transportation rates are to be designed to yield. It therefore becomes the duty of the Commission to define the purposes for which new capital is desirable. The United States needs a transportation program that looks further ahead than a few months, and a financial program upon which to base the rebuilding program. The Interstate Commerce Commission, entering upon a far-reaching experiment with a given level of rates to see whether it will bring to the roads the income, the capital and the improvements which the country requires, those who are tempted to agitate for rate reductions each on his own commodity should bear in mind

that if everybody was accorded the reduction he would like, railway facilities would be inevitably diminished below the requirements of our nation's commerce. A broad policy requires the fullest support of all our citizens.

IV.

Regulation and not management should be the policy of the government in its exercise of influence upon the character of railway facilities. Engineering and mechanical progress will be best assured when each road installs devices and methods of its own selection for meeting the tests officially prescribed, subject to official determination whether or not those tests are met, and, if not, wherein the test should be not what the appliance is but what it does. This will encourage invention, assure open competition among developers and makers, and give reason for existence to the valuable plants and organizations which competing purveyors now maintain for experiment, demonstration and inspection service.

V.

We vigorously dissent from proposals that have been made to centralize production of railway equipment under a board which would contain Government representatives. Purchase by a Government Bureau tends to over-standardization, to the arrest of advance, to emphasize upon price at the neglect of quality, upon cheapness rather than upon economy.

Election of Officers

Alba B. Johnson was re-elected president. The following were elected vice-presidents for the ensuing year: Samuel G. Allen, Franklin Railway Supply Company, New York; Stephen C. Mason, McConway & Torley Company, Pittsburgh, Pa., and Charles J. Symington, of the T. H. Symington Company, New York.

Three Epochs of American History

Address by Daniel Willard, President, Baltimore & Ohio

THE HISTORY OF THE American railroads very naturally divides itself into three epochs. The first great epoch embraces the period from 1827, when the first charter was granted for the construction of a railroad organized for the purpose of doing a general freight and passenger business, until December 28, 1917, at which time the President, acting under authority granted him as a war power, took possession and assumed control of the steam railroads in continental United States and proceeded to operate them as if in fact they were owned by the government. The second epoch may be said to cover the period of twenty-six months while the railroads were under the direct control and operation of the government. The third epoch began on March 1, 1920, when the railroads were returned to their owners under the provisions set forth in the Transportation Act of 1920.

I shall now refer briefly to the first epoch. The American railroad system, as we use the term, is made up of more than 1,800 independent companies which, under the terms of the Transportation Act, report to and are under the control of the Interstate Commerce Commission. Something like 200 of these companies, having annual revenues in excess of \$1,000,000 per year, are designated by the Commission as Class I railroads. These 1,800 or more companies have a combined main line trackage of about 265,000 miles, and together they own about 2,400,000 freight cars, about 69,000 locomotives and about 57,000 cars designed for passenger

train service—representing in all an aggregate investment in property of about \$20,000,000,000.

These properties were built up almost wholly from private funds invested voluntarily in the hope of receiving a satisfactory return in the form of profits. They were developed under the competitive system, and no one so far as I know ever attempted to visualize an American railroad system reaching to all parts of the country. As a matter of fact, the laws themselves discouraged such a combination or concentration of transportation agencies under one central control. It may be said, however, that until the process was checked by the Sherman Act and other similar laws, there was observable a definite and active tendency on the part of the roads to resolve themselves into groups designed to serve more effectively—and by effectively I mean efficiently and economically—the traffic needs of certain large territories. The New York Central, Burlington and Santa Fe systems reflect the practical result of such tendencies. As I have already said, even that tendency was disconcerted and checked, if not wholly stopped, by the operation of the laws. It is true that men of vision some few years previous to federal control began to discuss the problem in continental terms, but no definite steps in that direction were taken until the spring of 1917, and the action then taken, which resulted in the establishment of the War Board, was undoubtedly hastened, if not wholly inspired by the emergency created by the entrance of our country into the great war.

My friend, Mr. Kruttschnitt, who was one of the members of the War Board, prepared a very illuminating report of the activities of the Board. He stated in his report, among other things, that the American railroads as a whole during 1917 carried 127,000,000,000 more ton miles than they carried during 1915, two years previous. Mr. Kruttschnitt further stated that during the period of the War Board's activities orders were given by them for the movement of more than 200,000 empty cars, regardless of ownership, from one part of the country to another, where they could be used best to promote the winning of the war. Nothing of the kind had ever been done before or even contemplated in this country.

It has been said by some that the railroads broke down as transportation agencies in 1917. I think you will agree, however, that if the figures I have quoted from Mr. Kruttschnitt's report have any significance at all, they show clearly that the railroads not only did not break down, but on the contrary made an unprecedented performance.

It is true that in the fall of 1917 there began to be an excessive accumulation of cars on the eastern seaboard, and the transportation movement began to slow down, but there is no earthly reason for ascribing the situation to a breakdown of the railroads. On the contrary it might better and more truthfully be said that it was due to the fact that the railroads were able to carry and did carry more tonnage than could be absorbed by ships for export, and by mills for manufacture. The trouble was due to an excess rather than to a shortage of transportation.

The second epoch began with the taking over of the roads by the President. The Director General, acting for the President, had full authority to consolidate, co-ordinate and operate the railroads regardless of all laws, and he also assumed and exercised autocratic control over the movement of all traffic, and properly so under the circumstances.

The ton mileage carried by all the railroads under the Director General in 1918, he having full authority and no restrictions, was barely 2 per cent greater than it was under the unified direction of the War Board, with no control over priorities or tonnage movement and with all the restrictions imposed by a long series of restrictive laws. If the railroads had indeed broken down in 1917, then I submit that a breakdown plus 2 per cent would not of itself be a very big accomplishment in 1918. At the same time we do know that during the year 1918 the railroads rendered a splendid transportation service and thereby contributed much towards winning the war, but even so we must remember that the service rendered only reflected an increase of 2 per cent above what had been accomplished the previous year.

During the period of federal control the statement was frequently heard that the advantages of unified control and operation were so great that they should be retained in the interests of the people. It was also said that they could only be realized in connection with the policy of government ownership, or at least with federal control and operation. The fallacy of that statement, I think, has now been established; that is to say, the fallacy of that part of the statement which claims that the benefits of unified operation can only be realized in connection with governmental control. In justice to the railroads it should be remembered that the railroad presidents themselves were the first to visualize the supreme importance of unified control of the railroads in times of emergency, and not only did they visualize its value, but they gave definite expression to their vision through the operations of the War Board.

I shall not discuss further the second epoch, not, however, because it does not afford a basis for further discussion, but simply because it represents a wholly illogical development, from my point of view—brought about by war conditions and not by normal economic influences or requirements.

We now come to the consideration of the third or present epoch, which I hope and believe will be an enduring and successful one, based on the policy of private ownership and operation of the railroads with governmental control.

A careful reading of the debates which took place in Congress during the consideration of the new Transportation Act clearly establishes the fact that it was the belief of Congress at that time that private ownership and operation of the railroads ought to be continued in this country, and it was just as clearly the intention of Congress to make private ownership possible by suitable legislation, and the new Transportation Act of 1920 was framed with that end in view. While there is much that is new in the Act of 1920, I will refer only to some of its outstanding features, which I consider of fundamental importance.

Of first importance, as I view the matter, is the question of unified control, to which I have already made reference, because the advantages to be derived from unified control of the railroads are so important that unless they can be realized under private ownership in times of emergency, that fact of itself might compel the acceptance of some other policy. It should be clearly understood, however, that unified operation can only be had at any time at the expense of competition of service, and such a price is too much to pay even for unified control except in times of emergency. Congress evidently believed, having knowledge of what the railroads had accomplished under the War Board, that with suitable legislation the benefits of unified control and direction could be fully realized under private ownership when necessary, and they wrote an important portion of the law to cover that point.

In short, they gave to their agent, the Interstate Commerce Commission, full power in times of emergency to control and direct the movements of all the cars and all the engines of all the railroads regardless of ownership. Congress also said that in the exercise of this great power the Commission could make use of such agencies as it might select.

In harmony with and shortly after the passage of the law, the railroads appointed an advisory committee, consisting of eleven executives geographically selected, to take over the direction of the Car Service Commission in Washington, which had been created by the War Board and continued by the Director General.

The advisory committee was instructed to co-operate with the Interstate Commerce Commission for the purpose of carrying out and accomplishing the real intent of the law.

I think we may fairly say that the railroads have again demonstrated, if further demonstration be necessary, that the advantages of unified control and operation can be fully realized with private ownership and operation under the terms set forth in the new Transportation Act.

One other important feature of the Act, and the last to which I shall specifically refer, is worthy of consideration at this time, and that is the provision which deals with the labor problem and has to do directly with the wages and working conditions of upwards of 2,000,000 employees. We ought not to minimize the importance of the labor problem in its relation to the railroad question as a whole. It is manifestly important that there should be continuity of service by the railroads in a country such as ours, and one of the important problems before Congress was to insure if possible continuity of service, by guarding against the interruption of the service by any misunderstandings and disputes which might possibly arise between the railroad managers and their employees.

It was urged by some that the law should be written so as to prohibit strikes upon the railroads, but it was not possible to enact legislation of that character, nor do I think it would have been wise to enact such legislation at that time. While I am as much opposed as anyone to strikes upon the railroads, I believe it would be a mistake for Congress to pass a law

prohibiting strikes unless we are quite certain we shall be able to enforce such a law once it has been enacted. Personally I did not believe that we had reached a stage where we could feel confident that such a law would or could be effectively enforced, consequently I was opposed to its passage. Congress dealt with the matter, I think, in the wisest way possible under the circumstances. It created machinery or set up agencies by which the employees could be assured of obtaining just as fair wages and working conditions without striking as they could reasonably expect to obtain even if they did strike.

It may indeed be said that Congress by this Act has made a preferred class of the railroad workers, because so far as I know, this is the first and only time that Congress has ever definitely said that any particular class of the people should be given at all times and under all circumstances just and reasonable wages and working conditions. Of course Congress did not do this primarily in the interest of the workers. Congress acted only as it had a right to act in the interests of the nation as a whole. Congress acted with a full realization of the importance of an uninterrupted transportation system in a country such as ours, but being unwilling to deprive the workers of their right to strike (and nothing in this bill does deprive the workers of their ultimate right to strike), it sought to provide machinery which would make it unnecessary under any circumstances for the men to stop work in order to obtain just and reasonable treatment. In short, Congress provided or aimed to provide by law so that the railroad workers would at all times be assured of just as good wages and just as good working conditions without striking as they could reasonably expect to secure if they did strike, for it is clear that no one could justify or expect to win a strike for wages or working conditions that would be unjust or unreasonable.

It may also be that in some respects this portion of the law is incomplete and inadequate, and time may develop that changes are necessary. If so, they will undoubtedly be made. In the meantime it is certainly in the interest of all that the law, or especially this particular feature of the law, should be given a fair and thorough trial, and I firmly believe that as the law comes to be better understood by the railroad workers they will realize that they have indeed been made a preferred class, in which event I venture to predict that we shall be largely, if not wholly, immune from railroad strikes in the future, not, however, because the men have been forbidden to strike, for I repeat, there is nothing in the law which limits the right of the railroad workers to strike if they still want to do so, but simply because the law provides a way by which they can obtain without striking everything that they could reasonably expect to obtain if they did strike.

While some criticism has been voiced against the labor provision of the Act, not only by the employees but by the employers as well, I am still hopeful that this feature of the Act will eventually prove to be wise and satisfactory, and if the three features of the new legislation to which I have specifically referred work out as it was the intention and belief of Congress that they would work out, then I think Congress has made private ownership and operation of the railroads in this country possible, but whether private ownership and operation of the railroads endures—having been made possible—depends largely if not wholly upon whether the railroads under private ownership and operation are able to give and do give the public satisfactory service. At the present time it would seem that there is a majority, in fact a large majority, of public opinion in favor of private ownership and operation, but we have seen public opinion change suddenly, and I have no doubt that it would change again just as quickly and react just as strongly against private ownership, if the public felt that upon the whole they would be likely to get more satisfactory service some other way. As

I view the matter, private ownership and operation of the railroads is still on trial in this country, but it has everything in its favor and it ought to win and I believe it will win if the managers, measured by the service which they give the public, deserve to win.

Since the termination of federal control we have actually seen the railroads, operated by private management under the provisions of the Esch-Cummins Act, move in 1920, 9,000,000,000 ton miles more than in 1918, employing substantially the same facilities. We have seen the Interstate Commerce Commission, under the terms of the same Act, promptly authorize such rate increases as would, in its opinion, fulfill the requirements of the Act, and we have also seen one of the most complex labor situations ever developed, dealt with in orderly fashion by the agencies created by the Act, without interruption of the transportation service. The very fact of the controversy in Chicago speaks volumes for the Act. Questions involving wages and working conditions affecting nearly 2,000,000 human beings are certain to bring out points of difference, and if the contestants should sometimes raise their voices above the conventional pitch of polite society, it would not follow that the law had failed—on the contrary it would indicate that the problem was being worked out just as Congress intended it should be, and without interruption of the service. I am inclined to think that under the present law wages of railway workers as a whole may be somewhat higher in the future than would be the case were there no such law, but even so, if the public is thereby assured freedom from interruptions of service, the immunity so purchased will be well worth the price.

It has sometimes been said in the past that the Interstate Commerce Commission seemed to be anxious only to protect the interests of the public. Perhaps there may have been a modicum of truth in that statement; perhaps the Commission felt that the railroads were quite able to look after their own interests, and consequently let the railroads bear the burden of proof. But whatever may have been the situation in the past, the new law makes it clear that while Congress still expects the Commission to look after the interests of the public, just as carefully as it ever did in the past, Congress also recognized by definite expression that in looking after the interests of the public, the Commission should keep in mind that the public's interests will be best promoted by an efficient transportation service, and will not be promoted by a poor, badly developed and inadequate transportation service.

Opportunity has been afforded me to view the situation, and I have been convinced that the Commission has taken hold of the difficult problems confronting it under the new Act with the desire only of carrying out the clear intent of Congress. Chairman Clark and his associates with whom I have had occasion to come in contact, have always been most helpful. They have always been anxious to know all of the facts concerning any particular case, and have not hesitated to use their power and authority in such way as seemed to them most likely to promote the public welfare. The relationship which has developed between the Federal Commission and the railroads under the new Transportation Act to my mind is most encouraging, and if the relationship already established continues and if the railway managers appreciate that they themselves, as well as the institution of private ownership, are on trial, and if they meet the fair and reasonable requirements of the public for transportation, I feel confident that the success of private ownership is assured.

The fact that, from rates fixed in accordance with the provisions of the Act, the net earnings of the carriers at the present time are disappointing, is not due to any fault or failure of the Act. The condition referred to is due largely to the decline in volume of business and the excessive cost of operation. I am confident that the problems so presented, while complex and difficult, will be solved.

The New Problems of Management and Regulation

Address by Edgar E. Clark, Chairman, Interstate Commerce Commission

CONGRESS DEALT liberally with the railroads that had been taken from the possession of their owners as a war measure. For something over two years the government fixed the level and conditions of expenditures and of rates. The operating expenses were increased in greater proportion than were the rates and fares. Recognizing this situation Congress provided, for a period of six months following the termination of federal control, certain guaranties. It recognized that further increases in rates were imperatively necessary and it was contemplated that within that guaranty period arrangements would be made to make such increased rates effective. That policy and purpose were carried out with the result that rates and fares were placed upon a higher plane than they had been for many years. This fact, of course, attracted the attention of all users of our railroads. Too many of them, however, directed their attention to the charges for service and closed their eyes to the increased operating expenses.

Roads' Capacity Demonstrated

Immediately following the termination of federal control the railroads successfully moved a larger tonnage than had ever been moved. The capacity of the transportation machine was demonstrated. Serious interference resulted from labor difficulties and later the volume of traffic fell off due to readjustment of industrial conditions. The financial results from operation in recent months have been disappointing. Grave, and no doubt in many instances serious, losses have been experienced by producers and distributors. This has caused a good deal of impatience which has taken the form of demands for reductions in transportation charges. The official figures for the month of December show that for the United States the Class I roads had an operating ratio of 91.3. That means that the operating cost of earning each dollar was 91.3 cents, and 8.7 cents of each dollar were left with which to pay taxes, interest charges, and return upon property values. Obviously that margin is too narrow.

Modern Charioteers

As might be expected, suggested measures of relief are extreme or moderate dependent upon the point of view of the one who makes the suggestion. Phaeton, having been promised by his father, Apollo, that any wish that he might express should be granted, demanded that he be permitted for one day to drive the chariot of the sun. Unable to dissuade his son and unwilling to break his promise Apollo gave Phaeton careful instructions and warnings and permitted him to start. The last advice Apollo gave was "Spare the whip and hold tight the reins." Phaeton started but soon found that he could neither control nor guide the fiery steeds. They dashed headlong and unrestrained into unknown regions, now high in the heavens, now down almost to earth. The earth was scorched and blackened and was saved from destruction only by Jupiter launching a lightning bolt that struck Phaeton dead from the chariot. Modern Phaetons now clamor to be given permission to drive the chariot of transportation by railroad.

I knew a locomotive fireman who had difficulty in keeping the water in the boiler warm enough to shave with, but who could see, day by day, that the master mechanic and the superintendent were making pretty nearly clear scores of errors. Such men are now in evidence.

Reason Must Prevail

When we consider the circumstances out of which present conditions grew is it not sensible and reasonable to recognize

the necessity for gradual readjustment of the economic forces and affairs of the world as the foundation for gradual improvement in the situation we are discussing? Some rates are too high to permit the free movement of traffic. Some rates are unreasonably low. Careful study of such situations has been and is going on and readjustments have been and are being made accordingly. Doubtless there have grown up operating expenses, the aggregate of which is substantial, which cannot reasonably be defended. They should be eliminated. Every effort must be made to insure all possible, attainable, reasonable economies. The owners of the properties may be obliged for a time to accept less return upon their investment than would otherwise be expected. If reason can prevail and a united, genuine effort can be put forth and maintained, it is morally certain that the situation will improve and that we will progress toward that condition of affairs which the Congress had in view, which the law contemplates and which we all hope to see. Slightly paraphrasing an expression I read recently—"it is doubly incumbent upon us in the stand which we take to avoid the appearance of selfish shirking."

"We all know how large a part popular impressions have in forming public opinion and how long it takes for the slowly developing proof of facts to rectify such impressions when once they have taken hold." We must build upon the foundation of experience and sound business judgment that is free from "selfish shirking," and not upon the unstable ground of theories and opinions that in large part ignore the true facts.

Necessary Preferences

Some critics assert that the law makes of the railroad business a preferred business and confers upon the owners special favors. Others assert that it recognizes a preferred class of labor.

Conceding that on the surface there is that complexion, and assuming for the purpose of the discussion, but not admitting, that these preferences exist, I ask, if this be so, is it wrong? If this be so, why is it so? Congress recognized, as did all thoughtful men, that transportation is the life blood of commerce and industry and vital to the protection of our nation. It must be provided in adequate and reasonably efficient form. Continuous and dependable operation of our transportation machine is almost as important as is its existence. The law was formulated in the interest of the country and of the public. The capital invested in, and the men who operate our transportation machine are employed in serving the public which must and should compensate both. If it clearly appears that in order to give the country the quantity, quality and character of service that it needs, to which it is entitled, and for which it must pay, some preference, apparent or real, should be afforded to the capital and the men that are employed in that service, I submit that such preference is not undue so long as the public's right to reasonable and nondiscriminatory service and charges is protected. But if that capital and those men are recognized as having a preferred status because of the public character of the service in which they are employed, those men and the owners of that capital must recognize an obligation to the public which also springs from the character of the service in which they are employed.

Long before the Transportation Act was framed the Supreme Court had made it entirely clear that the Federal Commission was clothed with power and charged with the duty to require removal of undue prejudice against interstate shippers or localities and undue preference of State shippers and localities. That principle of law was accepted

as sound and as settled. The Transportation Act retains the condition that its provisions shall not apply to transportation wholly within one state. That provision is, however, in a section the foundation of which is that all rates, fares and charges shall be just and reasonable. In another section the Congress has put in statutory form what was the law before. It has made it a little more explicit by specifically prohibiting unjust discrimination against interstate commerce and has authorized a carrier to complain of such discrimination. The states are left free as they were before to regulate the state charges so long as they do not create undue preference of state traffic, undue prejudice against interstate traffic, or unjust discrimination against interstate commerce. The federal Commission does not interpret the law as conferring upon it any regulatory powers over the state rates or fares except for the purpose of removing the prohibited preference, prejudice or discrimination. It has found it necessary in several instances to exercise that power, and appeals therefore have been taken to the courts in various jurisdictions. In so far as the courts have spoken they have sustained the power exercised. The underlying question has been submitted to the Supreme Court of the United States and in due time will be by that body set at rest.

Fluctuation of Rates

One who is not versed in transportation charges and their effect can not appreciate the extent to which changes are necessary due to constantly changing commercial and industrial conditions and to competitive relationship between carriers and between communities and commodities. It is neither necessary nor desirable that the States shall be shorn of power to regulate their internal affairs. The same considerations that led the framers of the Constitution to reserve to the federal government the powers to which I have referred require retention and exercise of those powers within reasonable and appropriate limits. If a state has the right to require the railroads traversing it to serve the citizens of that state at lower charges than they contemporaneously assess against the citizens of other states, the effect would be the same as if that state were to levy a tax upon outsiders for the privilege of transporting goods into the state.

When the Supreme Court shall have spoken and these controversies have been stilled it will, I predict, be found that in principle and substance the law is not materially different now from what it was when that court decided the Shreveport case. When that clarification of the law shall have occurred there will, I think, be no serious difficulties about the exercise by the federal and state regulating bodies of their respective powers in their respective fields.

Local Self-Government

I would not unduly centralize power and control. I like to think of the United States as a single entity, and the experiences through which we have just passed have emphasized more strongly than ever before the fact that among the nations of the world we must be so considered and must so consider ourselves. At the same time in the conduct of our domestic affairs we can and should adhere as far as is practicable to the ideas of self-government and local government, reserving, however, certain fundamentals for control and administration by the national government.

The growth of civilization has been accompanied at every step by the maintenance and exercise of the police power. Peaceful possession of property and safety to life could not otherwise exist. The police power must extend as far as civilization and human rights extend. The limits of the jurisdiction of the various police powers must be clearly defined and properly recognized, and that after all is the real question in the controversies to which I have just referred.

It is not alone in what might be called minor matters of competition and charges that changes which affect transportation problems in substantial degree come with frequency and rapidity. These changes, some of them almost fundamental, must be taken into account along with arrangements for caring for the steadily and continuously growing population and traffic.

Water and Highway Lines

During the war expenses of operation on vessels increased more than they did on railroads. There was a heavy demand for ships in overseas traffic and transportation by rail and water became more expensive than by rail. The currents of traffic were markedly affected thereby. In the light of the experiences of generations it can not be expected that water transportation will long remain on a higher level of cost than transportation by land. There is now an abundance of ships and no one can predict the extent to which they will be employed in direct competition with our railroads or the extent to which that competition will necessitate readjustment of the affairs of the railroads.

The development of the automobile and the auto truck and the building of good roads have made possible transportation for comparatively short distances by that means in sharp competition with the railroads. During the war the utilization of that and other methods of transportation was urged in an attempt to relieve the railroads in their efforts to move the tremendous volume of traffic which was offered. Now freight is moving in substantial quantities in that manner instead of by railroads. In many instances it is doubtless the cheaper method of transportation. The state furnishes and maintains the right of way and track.

No one can confidently predict what the effect of the solution of these problems may be upon questions which we perhaps now consider as settled. New problems will arise, and so with continuous changes in the affairs of men, of business and of nations there is an ever present necessity for changes in the facilities and machines through and by means of which transportation is conducted. No one can now see clearly the extent to which electricity will be substituted on our railroads for steam power.

No General Rate Reduction

It is no time for stubborn thinking, but it is a time to think of facts, which are said to be stubborn things. The whole country and all of our people, excepting those who are and have been shamelessly profiteering, are suffering the after effects of a titanic war. In some places the agriculturist and the horticulturist are leaving their crops to decay in the fields and on the trees because they can not sell them at prices that more than cover the costs of harvesting, transporting, and marketing, and yet the housekeeper purchasing for the home table finds the cost of such commodities close to what it was during the active hostilities.

In some quarters zealous efforts are made to have it appear that this situation is in large part or in the main due to high freight rates. The freight rates are high. I have yet to meet a well informed man who does not feel that as a general thing they can be made no higher as a revenue measure. Careful inquiry into some distressing situations discloses that the utilization of products is prevented, not by freight rates, but by economic conditions and perhaps manipulated markets. In November, 1920, the average ton-mile revenue of the railroads of the United States was 75.7 per cent higher than in 1913. At the same time the wholesale prices of commodities that are transported in large quantities averaged 107 per cent higher than in 1913, and in May, 1920, they were 172 per cent over 1913. Reference has been made to operating costs of the railroads. Until the foundation has been laid for widening the margin between the revenue and the cost of earning it, it is difficult to find justification for a general reduction in rates.

General News Department

The thirteenth annual meeting of the International Railway Fuel Association will be held on May 24 to 26 at the Hotel Sherman, Chicago.

Traffic was resumed on the Missouri & North Arkansas on March 24 after a tieup of more than a week due to the destruction of the road's property by strikers. One train was started each way on the northern end of the line with guards on the train and special officers and citizens volunteers to prevent further destruction of bridges or other property.

The Committee on Relations of Railway Operation to Legislation, provided for by the action of the American Railway Association at Chicago, last November, consists of the following members: W. J. Jackson (chairman), C. & E. I.; L. W. Baldwin, I. C.; E. P. Bracken, C. B. & Q. This committee will work in close co-operation with Colonel A. P. Thom, general counsel of the Association of Railway Executives.

The Freight Station Section of the American Railway Association has begun operations under a temporary committee of direction; and each railroad is requested to furnish the committee with names of officers or agents who are to serve as representative members. Where more than one is designated the advice should give the name of the individual who is to cast the vote of the railroad company. This information should be sent to R. O. Wells, secretary of the Section, 431 South Dearborn street, Chicago.

P. J. McNamara, vice-president of the Brotherhood of Locomotive Firemen and Enginemen, and W. L. McMenimen, deputy president of the Brotherhood of Railroad Trainmen, called on President Harding last week to discuss the railroad situation and urge him to appoint a railroad employee as a member of the Interstate Commerce Commission. Representatives of various organizations whose membership consists largely of the so-called "subordinate officials" called on President Harding on March 28 and submitted several names from which he was urged to select one as a member of the Railroad Labor Board.

The National Lumber Manufacturers' Association has been asked by the National Retail Lumber Dealers' Association to join in a demand upon the Railroad Labor Board that the shipping public be given consideration in the controversy over wages and working conditions in railroad employment. The association urges that the public be given a hearing, the national agreement abrogated, and that the railroads be allowed to take the action they deem necessary for the protection of the public interest and the revival of prosperity for the transportation systems in order that business conditions may be stabilized.

"Summer time" will prevail in Massachusetts for five months this year, a law to that effect having been approved on March 23. The Boston & Albany intends to adopt its summer time-table on April 24, the same date on which the New York, New Haven & Hartford changes the times of trains to correspond with the daylight saving action of New York City. The city of Providence, Rhode Island, has provided for five months' summer time, the legislature of the state having failed to take action. Towns in Connecticut near New York City have asked the governor to refuse approval of the recent act of the Connecticut legislature requiring clocks to be continued on Eastern Standard time. The Merchants' Association of New York City is working for a referendum, to be held next November, on the question of establishing summer time throughout the state of New York. The governor of Michigan has issued a proclamation urging all cities and towns in that state to adopt Eastern time, be-

ginning April 3, as a daylight-saving measure. A number of cities in Michigan have already taken action looking to the adoption of Eastern time in the summer.

Proposed changes in the classification of railway employees for statistical and similar purposes were considered at a joint hearing held at Washington on March 30 by Horace Secrist, statistician of the Railroad Labor Board, and M. O. Lorenz, chief of the Bureau of Statistics of the Interstate Commerce Commission. Mr. Secrist explained that it was of great importance for the purposes of the board to have more accurate classification of railway employees than has heretofore been found necessary and that it was especially important that there be accurate definitions of the various classifications so that there might be general agreement in discussing these matters. The board had proposed a tentative classification of 148 classes and has been working in connection with the Interstate Commerce Commission with a view to having similar classification used by the commission for statistical purposes. Alfred P. Thom, representing the railway executives, said that this increase in the number of classifications would add \$4,000,000 a year to the expense to the railroads of reporting the information and he suggested that the plan be simplified by a reduction to 123 classes. It was then decided to hold a series of round table conferences attended by the representatives of the two boards, of the railroads, and of the railroad employees, for the purpose of working out the details of the classification.

Aishton Asked to Take Charge of Railway Mail Service

R. H. Aishton, president of the American Railway Association and formerly president of the Chicago & North Western and later regional director under the Railroad Administration, has been offered the position of second assistant postmaster general, in charge of the railway mail service, under the new postmaster general, Will H. Hays. It is understood that Mr. Hays is very anxious to have Mr. Aishton accept the position, but Mr. Aishton's attitude has not yet been stated.

Mechanical Division of A. R. A. to Meet in Chicago

The General Committee of the Mechanical Division of the American Railway Association, at a meeting in New York on March 30, decided to hold a business session at the Hotel Drake, Chicago, on June 15 and 16, instead of the convention that was to have occurred at Atlantic City. The program has been modified and reports will be presented only by the committees on the following subjects: Prices for Labor and Material, Car Construction, Loading Rules, Brake Shoe and Brake Beam Equipment, Train Brake and Signal Equipment, Specifications and Tests for Materials, Tank Cars and Standard Methods of Packing Journal Boxes. Both morning and afternoon sessions will be held while the division is meeting.

Railroads Report Deficit for January

Preliminary compilations of the reports to the Interstate Commerce Commission of 202 roads for January show a deficit of \$1,167,000. One hundred and nine of the companies failed to earn their expenses and taxes for the month, as compared with 88 that had deficits in December. To earn a 6 per cent return on their valuation it has been estimated that the railroads should have earned in January about \$67,000,000. Of the roads that had deficits 45 were in the Eastern district, 16 in the Southern and 48 in the Western. The total operating revenues for January were \$468,834,000, an increase of 5.2 per cent as compared with 1920. The total operating expenses were \$442,000,000, an increase of 6.6 per cent. Freight revenues for the month were \$323,000,000, an increase

of 4.2 per cent, while the passenger revenues were \$105,000,000, an increase of 14.6 per cent. For the five months dating from the rate increase the net operating income of the carriers has been \$225,000,000, which would be at the rate of 2.84 per cent a year on the valuation.

Investors Invite Brotherhoods

S. Davies Warfield, president of National Association of Owners of Railroad Securities has asked the "big four" railroad employees' brotherhoods to appoint a committee to confer with a special committee of twenty-five financiers and bankers on the solution of the present country-wide freight-rate and wage-rate problem. "An immediate and partial remedy seems to lie in an adjustment of relations between the railroads and their employees," said his letter. "One Governmental body sitting in Washington cannot be expected to successfully adjust rates and fares to meet the expenses incident to railroad operations while another, sitting in Chicago, attempts to adjust wages, the largest and most important of all railway operating expenditures which can only be met by rates the commission alone is required to establish."

Mr. Warfield hopes to have the conference on April 4, in New York. The four brotherhoods invited, are the Brotherhood of Locomotive Engineers, Brotherhood of Locomotive Enginemen and Firemen, Brotherhood of Railroad Trainmen and the Order of Railway Conductors.

New Terminal Plans for Chicago

Plans for a drastic rearrangement of all of the railway terminals occupying the area immediately south of Chicago's business center have been submitted to the mayor and city council of Chicago by the Chicago Railway Terminal Commission of which John F. Wallace is the chairman. This plan involves a straightening of the Chicago river between Polk and Sixteenth streets in an area occupied almost exclusively by the railroads. It also implies the removal of all terminal developments of the railroads in the area north of Roosevelt road between the Chicago river and State street as well as a considerable area south of Roosevelt road between State street and Clark street, thereby doing away with the Grand Central, La Salle and Polk street passenger terminals, these facilities to be replaced by adequate passenger terminal developments in connection with the Illinois Central lake front project. The freight terminals to be eliminated will be replaced by an extensive freight house and team track development in the area west of Clark street and south of Roosevelt road. The advantage claimed for this plan from the standpoint of the city would be the extension of four through north and south streets southward from the central business district which are now obstructed by railway properties.

To Make First Class Ticket Sellers

J. S. McClure, manager of the Consolidated ticket office at Denver, Colo., in a recent circular, gave his clerks a list of "a few good things to do," which will make interesting reading in any ticket office. He begins by telling the clerks that "this is old stuff"—which is true; but it is fresh advice nevertheless. Following are some samples:

Trying. Try to grant the passenger's request. Try to find instructions that will let you do so. Most requests can be granted if you try to find a way. When reasonable requests are apparently unauthorized, take up with agent's office and we will try to help you. When refusal is necessary, do so with regret, and explain why. We can please nearly everyone if we really try.

Don't take the easiest way and try to find an instruction that will allow you to refuse. Don't be curt or seem in a hurry in refusing.

Know your business. Know it in advance. Study and understand tariffs and fares. Understand folders and guides. Understand routes and optional routes, and give passenger the benefit. Understand tickets. If you don't know, *don't guess*. Find out, and remember. Learn the reason. There is a reason for rates, routes, etc., and you can find out. It will help avoid mistakes.

Interest. Take an interest in your passenger. His trip means a good deal to him, and he welcomes your interest. Cultivate

talking and getting an interest. It is easy to do, and enjoyable. It really makes your work easier, and much more satisfactory. It makes for a satisfied and thankful patron. But it must be a real interest, and not put-on or deceptive.

Be sure about little things. They count.

Pleasing. Most any one can get along nicely with 19 out of 20 of our patrons. Make a study of it and please the other one. The really good man can "handle" them all. If you make a mistake in your "handling" of a patron, profit by it and never make the same mistake again.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 163 Broadway, New York City. Next convention, May 3-6, 1921, Hotel Sherman, Chicago. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Fred W. Venton, 836 So. Michigan Ave., Chicago. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—S. W. Derr, Philadelphia & Reading, Philadelphia, Pa.

AMERICAN ASSOCIATION OF ENGINEERS.—C. E. Drayer, 29 S. La Salle St., E. I. R. R., 332 South Michigan Ave., Chicago. Next meeting, June, 1921, Quebec, Can.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next convention, August 24-26, 1921, Kansas City, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill. Next convention September 12-14, Hotel Sherman, Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y. Next regular meeting, November 16, 1921.

Division I—Operating, W. J. Fripp (Chairman), General Manager, New York Central Railroad, Eastern Lines, New York, N. Y.; R. E. McCarty (Vice-Chairman), General Manager, Central Region, Pennsylvania System, Pittsburgh, Pa.

Freight Station Section (including former activities of American Association of Freight Agents), C. E. Fish (Chairman), Freight Agent, Baltimore & Ohio Railroad, Cincinnati, Ohio; J. C. Gilmore (First Vice-Chairman), Agent, Pennsylvania System, Eastern Region, Philadelphia, Pa.; C. M. Teschemacher (second Vice-Chairman), General Agent, Chicago & Alton Railroad, Chicago, Ill.; R. O. Wells (Secretary), Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section, D. Z. Dunott (Chairman), Chief Surgeon, Western Maryland Railway, Baltimore, Md.; G. G. Dowdall (First Vice-Chairman), Chief Surgeon, Illinois Central Railroad, Chicago, Ill.; Duncan Eve (Second Vice-Chairman), Chief Surgeon, Nashville, Chattanooga & St. Louis Railway, Nashville, Tenn.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association), R. S. Mitchell (Chairman), Chief Special Agent, Missouri Pacific Railroad, St. Louis, Mo.; H. L. Denton (First Vice-Chairman), General Superintendent of Police, Baltimore & Ohio Railroad, Baltimore, Md.; Emmett Gregg (Second Vice-Chairman), Superintendent Special service, Atchison, Topeka & Santa Fe Railway, Topeka, Kan.; J. C. Caviston (Secretary), 75 Church St., New York, N. Y.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents), H. Hulatt (Chairman), Manager of Telegraphs, Grand Trunk Railway, Montreal, Que.; W. H. Hall (First Vice-Chairman), General Superintendent of Telegraph, Missouri, Kansas & Texas Lines, Denison, Texas; R. F. Finley (Second Vice-Chairman), Superintendent Telegraph, New York Central Lines, West of Buffalo, Cleveland, Ohio; W. A. Fairbanks (Secretary), 75 Church St., New York, N. Y.

Division II—Transportation (including former activities of the Association of Transportation and Car Accounting Officers), E. J. Pearson (Chairman), President, New York, New Haven & Hartford Railroad, New Haven, Conn.; J. J. Bernet (Vice-Chairman), President, New York, Chicago & St. Louis Railroad, Cleveland, Ohio; C. W. Crawford (Chairman, General Committee), 431 South Dearborn St., Chicago, Ill.; G. W. Covert (Secretary), 431 South Dearborn St., Chicago, Ill.

Division III—Traffic, G. H. Ingalls (Chairman) Vice-President, New York Central Lines, New York, N. Y.; J. Gottschalk (Secretary), 143 Liberty St., New York, N. Y.

Division IV—Engineering, H. R. Safford (Chairman), Assistant to the President, Chicago, Burlington & Quincy Railroad, Chicago, Ill.; C. J. Kelloway (Vice-Chairman), Superintendent of Signals, Atlantic Coast Line Railroad, Wilmington, N. C.; E. H. Fritch (Secretary), 431 South Dearborn St., Chicago, Ill. Next annual meeting, March 15-17, 1921, Chicago, Ill.

Construction and Maintenance Section, H. R. Safford (Chairman), Assistant to the President, Chicago, Burlington & Quincy Railroad, Chicago, Ill.; E. H. Fritch (Secretary), 431 South Dearborn St., Chicago, Ill.

Electrical Section, George Gibbs (Chairman), Chief Engineer of Electric Traction, Long Island Railroad, New York, N. Y.; E. B. Katte (Vice-Chairman), Chief Engineer Electric Traction, New York Central Railroad, New York, N. Y.; E. H. Fritch (Secretary), 431 South Dearborn St., Chicago, Ill.

Signal Section (including former activities of the Railway Signal Association), F. W. Pfleging (Chairman), Signal Engineer, Union Pacific Railroad, Omaha, Nebr.; F. B. Wiegand (First Vice-Chairman), Signal Engineer, New York Central Railroad, Western Lines, Cleveland, Ohio; C. A. Christofferson (Second Vice-Chairman), Signal Engineer, Northern Pacific Railway, St. Paul, Minn.; H. S. Balliet (Secretary), 75 Church St., New York, N. Y.

April 1, 1921

RAILWAY AGE

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Traffic News

F. X. Baur, heretofore supervisor of transportation on the Lehigh Valley, has been appointed transportation manager of the North American Fruit Exchange, 90 West street, New York, and W. V. Degan, heretofore manager of the freight claim bureau of the L. V., has been appointed freight claim agent of the Exchange.

The Pennsylvania Railroad has "reorganized its entire freight service" on regular schedules. From Chicago, St. Louis and the middle west to eastern terminals, and from New York, Philadelphia, Baltimore and other eastern points to western terminals the freight trains run on these schedules are delivering freight at destination in from one to two or three days earlier than heretofore. The purpose, however, is to insure regularity rather than exceptionally fast time, and the movement of these trains is followed up as though they were passenger trains. From Chicago the delivery at New York, Philadelphia, Baltimore, etc., is, for livestock, the third morning; for perishable freight, the fourth morning; and other traffic, the fifth. From St. Louis the time is one day longer. Westbound, the delivery is scheduled for Chicago, Fort Wayne, Toledo and Cincinnati on the fourth morning, and other points in proportionate time.

The Coal Traffic of Canada

The coal production of Canada in 1920 amounted to 16,968,658 short tons as against 13,919,096 tons in the preceding year, or an increase of 21.9 per cent. Exports increased to 2,558,223 tons as compared to 2,070,050, but this was counterbalanced by an increase in imports from the United States from 16,982,773 to 20,815,596 tons. Nova Scotia yields to Alberta the honor of being the largest producer, the western province leading the eastern by nearly 4 per cent. Alberta produced 41 per cent of the total output; Nova Scotia, 37.8 per cent; British Columbia, 18.3 per cent; Saskatchewan, 1.9 per cent, and New Brunswick, less than 1 per cent. The war, which cut down shipments of anthracite from the United States, gave Alberta an opportunity to push her product. Shipments of Alberta coal eastward amounted to 500,000 tons in 1920 as against only half that amount in 1919.

Traffic Statistics

The Interstate Commerce Commission has issued its monthly traffic summary from reports of large steam railroads for December and the 12 months ending with December, 1920. For December the revenue tons carried one mile were 31,804,415,000 as compared with 30,856,283,000 in December, 1919. The average haul per revenue ton per railroad was 185.19 as compared with 187.74 and the revenue per ton mile was 1.209 cents as compared with .98 cents. The report shows a slight reduction in the number of revenue passengers carried and in passenger mileage for the month. The number of passengers carried was 99,181,982 as compared with 100,805,201. The passenger mileage was 3,640,548,000 as compared with 3,803,166,000. The average miles per revenue passenger per railroad was 36.71 as compared with 37.73. The average revenue per passenger mile was 3.142 cents as compared with 2.626 cents.

For the calendar year the number of revenue tons carried was 2,234,000,000 as compared with 2,034,000,000 in 1919. The ton miles were 409,970,000,000 as compared with 364,025,000,000. The average haul per railroad for the year shows an increase, 183.47 as compared with 178.97. The average revenue per ton mile was 1.052 cents as compared with .973 cents. The number of revenue passengers carried was 1,234,000,000 as compared with 1,174,000,000. The passenger mileage was 47,724,000,000 as compared with 46,192,000,000. The average miles per revenue passenger per railroad was 37.86 as compared with 39.32. The average revenue per passenger mile was 2.747 cents as compared with 2.545 cents.

Commission and Court News

New York Commissions Reorganized

The two New York Public Service Commissions are abolished, the division of the state into two districts, first established in 1907, is done away with, and a new public service commission of five members is to be constituted for the whole state. This radical change is embodied in a new law approved on March 30, and Governor Miller says that the new appointees will be nominated by him within ten days. It is expected that one or more of the present members of the Commission for the Second District will be named.

The new commission will have increased powers. It is to be composed of five members. Their terms are fifteen years and they are removable only after a two-thirds vote of the legislature. The salary of each member is \$15,000. The Governor intends to appoint two members from the city of New York.

In place of the existing commission for the First District, the duties of which have been mainly in connection with the subway and elevated railroads of New York City, the new law establishes a Transit Commission of three members, to devote itself wholly to these city lines, including authority over the construction of new lines. It will have extensive powers in the regulation of the fares on these lines, all of which are still on the old basis of five cents. The terms of the members of the Transit Commission will be five years.

Personnel of Commissions

James C. Davis Appointed

Director General of Railroads

President Harding on March 26 issued proclamations appointing James C. Davis, heretofore general counsel of the Railroad Administration, as director general of railroads in charge of the liquidation of the affairs of the Railroad Administration and also as the statutory agent against whom suits are to be brought arising from federal control of the railroads. He succeeds John Barton Payne, who resigned as director general following his retirement as Secretary of the Interior.

Mr. Davis has been general counsel of the Railroad Administration since July, 1920, when he succeeded E. M. Underwood, having been general solicitor of the Chicago & North Western. He was born in Keokuk, Ia., on September 2, 1857. He attended the public schools there and the Hellmuth Boys' College at London, Ont. He was employed in the law office of C. P. Lomax, Keokuk, Ia., was admitted to the bar in 1877 and practiced law at Keokuk between 1877 and 1903. From 1881 to 1883 he was city solicitor of Keokuk. On January 3, 1903, he was appointed general attorney for the Chicago & North Western for the state of Iowa with headquarters at Des Moines, which position he held for 16 years, until in 1918, he was appointed general solicitor of the Chicago & North Western under the federal administration, with headquarters at Chicago.

In a letter to Judge Payne the President said:

"I have inquired for you several times this week because I wished to have a conference with you respecting the appointment of your successor. I came to the conclusion today that the matter ought not to remain open longer and I have this day issued a proclamation naming Mr. Davis for your successor as director of railroads. I cannot allow this action to pass without conveying to you my gratitude for the signal service you have rendered the country, not only in the important work you have done in connection with the administration of the railways but also your notable contributions to the government service in one of the most difficult periods of all our history. I am quite sure the country shares the gratitude which I so willingly express. I trust your retirement from direct responsibility will not make it impossible for your successor and the Executive to avail themselves of your vast knowledge and helpful experience."

Equipment and Supplies

Locomotives

W. R. GRACE & Co., New York, are asking for prices on 6 locomotives for export.

The EGYPTIAN STATE RAILWAYS are inquiring through the locomotive builders for some 2-6-2 type locomotives.

The CHILEAN STATE RAILWAYS are inquiring through the Vulcan Iron Works for some 2-8-2 type locomotives.

THE OKINAWA-KEN (Japan) is inquiring through Mitsui & Co., 65 Broadway, New York, for 3, 0-6-0 type tank locomotives.

THE TOBU RAILWAY (Japan) is inquiring through Mitsui & Co., 65 Broadway, New York, for 2 Mogul type locomotives with tenders.

Freight Cars

The LAKE CHAMPLAIN & MORIAH is inquiring for from 12 to 15 ore dump cars.

THE BALDWIN LOCOMOTIVE WORKS is asking for prices on 100 box cars for export.

The UNION MINERE DU HAUT KATANGA is inquiring through the car builders for 50 steel hopper cars of 30 metric tons capacity.

THE ERIE RAILROAD is inquiring for 1,000 single sheathed 40-ton box cars. This road has also been asking for prices recently for repairing 1,000 box cars.

The RHODESIAN RAILWAYS, reported in the *Railway Age* of February 11, as inquiring through the car builders for 15 cars, have ordered this equipment from English car builders.

The PEKIN-MUKDEN, reported in the *Railway Age* of March 11 as inquiring for 200 gondola and 200 box cars, has ordered this equipment from the Metropolitan Wagon Works, England.

THE DELAWARE, LACKAWANNA & WESTERN is having repairs made to 1,000 box cars at the Berwick shops of the American Car & Foundry Co. This is in addition to the 1,000 cars on which repairs were authorized to be made at the same plant last October.

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of February 25 (page 483) as inquiring for 1,000, 50-ton gondolas, has ordered this equipment from the American Car & Foundry Company; and 300, 50-ton gondola cars noted in the *Railway Age* of March 18 (page 737), from Haskell & Barker Car Company, Inc.

Passenger Cars

The FEDERAL RAILWAYS, Eastern Brazil, are getting prices through the car builders on 2 first-class coaches and 6 combination baggage and mail cars.

Iron and Steel

The MAINE CENTRAL is inquiring for 400 tons of fabricated steel for a bridge at Norridgewock, Maine.

Machinery and Tools

The GENERAL ELECTRIC COMPANY, Schenectady, N. Y., is inquiring for 30 machine tools, including turret lathes, power presses and milling machines.

Miscellaneous

The NEW YORK, NEW HAVEN & HARTFORD is asking for bids until 12:00 o'clock April 6, for between 310,000 and 385,000 net tons of deep mined, high volatile R. M. bituminous coal, to be delivered between May 1, 1921, and April 1, 1922.

Supply Trade News

E. E. Goodwillie has been appointed sales agent in charge of the Cleveland office of the Bethlehem Steel Company, Bethlehem, Pa.

W. D. Jenkins, Dallas, Tex., has been appointed southwestern representative of the Burden Iron Company Railroad and Steamship Division, New York.

The Universal Crane Company, Cleveland, Ohio, announces the removal of its plant from Cleveland, Ohio, to its new factory at Elyria, Ohio, construction on which has just been completed.

Frank H. Freeman, assistant sales manager of the Anaconda Copper Mining Company, with headquarters at Chicago, has been appointed general sales manager of the Illinois Wire & Cable Company at Syracuse, Ill. Mr. Freeman will assume his new duties about April 1.

Allan A. Ryan has resigned as a director of the Chicago Pneumatic Tool Company, New York. Mr. Ryan also resigned as a director of the Vanadium Corporation of America and has been succeeded on the board of the latter company by T. M. Schumacher, president of the El Paso & Southwestern System.

E. G. LeLaurin has resigned as southern sales representative of the Southern Supply & Hardware Co., St. Louis, Mo., to serve in a similar capacity with W. D. Jenkins, representative of railway equipment and supplies, Dallas, Tex. Mr. LeLaurin will serve the trade in the Dallas-Houston-New Orleans territory.

The Lima Locomotive Works, Inc., has been authorized by the New York Stock Exchange to list \$2,865,000 7 per cent cumulative preferred stock, par \$100, and \$4,350,000 common stock, par \$100, with authority to add \$335,000 preferred stock and \$3,200,000 additional common stock on official notice of issuance on conversion of preferred stock, making the total amounts applied for \$3,200,000 7 per cent cumulative preferred stock and \$7,550,000 common stock.

The Lilly Varnish Company, Indianapolis, Ind., was sold on February 1 to an organization consisting of C. M. Malott, president; C. F. Brigham, vice-president and general manager, C. F. Hackathorn, vice-president in charge of manufacture and purchases, and W. I. Longsworth, secretary and sales manager. Mr. Malott is also president of the Indianapolis Paint & Color Company. William Lilly, who has managed the Lilly Varnish Company for a long time, will remain with the new organization as treasurer.

A fire in the Winthrop Harbor, Ill., plant of the Austin Machinery Corporation, Chicago, on March 22, destroyed the unfinished stock, warehouse and store rooms; also both the trenching machinery assembly and paving mixer assembly buildings, and a number of machines on which assembly was practically completed; but the fire did not reach the finished machine warehouses. The damage at Winthrop Harbor will not interfere with production and prompt delivery of Austin products, as all lines of Austin machinery are also being built at the plants at Muskegon, Mich., and at the former plant of the Toledo Bridge & Crane Co., Toledo, Ohio.

American Brake Shoe and Foundry Company

The annual report of the American Brake Shoe and Foundry Company for the year ended December 31, 1920, shows a net income, including \$542,293 received in final settlement of munitions contracts with the government, of \$2,571,848. This sum, after deducting the amount required for payment of the preferred stock dividends, is equivalent to \$12.86 per share on the outstanding common stock.

President Joseph B. Terbell in his report says: "The beginning of the year 1920 was of exceptional promise. During the

first nine months, the volume of operations in all of your company's plants exceeded that of any previous period, but the last quarter witnessed a decrease in incoming orders and a partial cancellation or suspension of orders that had previously been received, particularly in your malleable plants and the grey iron foundries, whose principal product is automotive castings. The average rate of production for the entire year was 77 per cent of capacity compared with 52.9 per cent for the year 1919.

"The duration of the period of adjustment through which the railroads and industries are passing will have considerable effect upon the earnings for the ensuing year. We are fortunate, however, in having a large proportion of our plant capacity devoted to the manufacture of commodities for which, even in periods of depression, there must be a moderate demand.

"The question of providing facilities for producing brake shoes in the Denver, Col., territory has been under consideration for some years, and the recent advance in freight rates made immediate action necessary. A new plant located at that place was, therefore, purchased. This plant started operations on September 1, 1920, and the results so far obtained have fully met expectations."

The consolidated balance sheet of the American Brake Shoe & Foundry Company, and subsidiaries, as of December 31, 1920, follows:

ASSETS	1920
Cash	\$580,155
Accounts receivable	4,757,580
Notes receivable	164,473
Marketable loans and investments	86,665
Advances	
Inventories	4,860,130
U. S. and Canada bonds	103,300
Deferred assets	152,053
Mortgages receivable	260,000
Capital stocks of associated companies	2,509,963
Plants and equipment, less depreciation	5,526,301
Patents, good will, etc.	6,814,113
	<hr/> \$25,814,735
LIABILITIES	
Accounts and wages payable	\$3,321,899
Notes payable	254,000
Bond interest accrued	2,000
Federal taxes	226,151
Bonded debt	120,000
Reserves	671,055
Preferred stock	9,463,700
Common stock	*21,212,830
Capital stock of subsidiary companies	6,800
Surplus	*
	<hr/> \$25,814,735

*Outstanding 148,410 shares of no par value represented by surplus of \$11,749,130.

Trade Publications

URANIUM IN STEEL.—The history and function of uranium in the making of uranium steels, together with analytical methods and test charts, is the subject matter of a 32-page booklet published by the Standard Alloys Company of Pittsburgh, Pa.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company, which was noted in the *Railway Age* of March 25 (page 821), as contemplating the construction of a craneway building to cost about \$13,000, at Topeka, Kan., will close bids for this work on March 29.

CHICAGO, MILWAUKEE & ST. PAUL.—This company contemplates rebuilding its coaling station at Wabasha, Wis., which was recently destroyed by fire.

CHICAGO UNION STATION.—This company, which was announced in the *Railway Age* of March 4 (page 532) as awarding a contract to the Chicago Foundation Company, Chicago, for the excavation work in connection with the new railway mail terminal, Chicago, and which was announced in the *Railway Age* of March 25 (page 821) as awarding a contract to the MacClintock-Marshall Company, Pittsburgh, Pa., for fabricating the structural steel to be used in connection with this project, will shortly accept bids for the construction of the terminal itself.

GREEN BAY & WESTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of its La Crosse branch, 6.38 miles, on the ground that it is being operated at a net loss.

ILLINOIS CENTRAL.—This company, which was noted in the *Railway Age* of March 4 (page 532), as contemplating the installation of a new 100-ft. turntable at Waterloo, Iowa, at an estimated cost of \$45,000, is now accepting bids for this work.

ILLINOIS CENTRAL.—This company will shortly accept bids for building a viaduct over McLemore Avenue, Memphis, Tenn.

LONG ISLAND.—This company is preparing plans for grade crossing elimination at Far Rockaway, N. Y., to cost in excess of \$2,500,000.

OKLAHOMA-SOUTHWESTERN.—This company, which is constructing a line from Bristow to Nuyaka, Okla., a distance of 24 miles, has completed the line from Bristow to the crossing of the Canadian river at Deep Fork, a distance of 20½ miles. The company has awarded a contract to Allhands & Davis, Okmulgee, Okla., for grading between Deep Fork and Nuyaka. The company contemplates extending its line south of Nuyaka to Okmulgee, a distance of 12 miles, upon completion of the present work.

ST. LOUIS-SAN FRANCISCO.—This company is engaged in improving and extending its yards at Sapulpa, Okla., at a cost of \$75,000. The company also contemplates additions to its passenger station at Sapulpa to cost about \$85,000.

UNION PACIFIC.—This company, in co-operation with the city of Kansas City, Mo., contemplates the construction of a viaduct over 23rd street, Kansas City.



Photo by International

The First Car of Corn Given by American Farmers to Starving Europeans

COMING HOME TO ROOST.—Yonder is the great Railway Farm, worth about \$20,000,000,000. Originally it produced transportation. See it now, covered with an enormous brood of chickens, constantly eating, yet calling for more. They were hatched in the Government Ownership incubator, which is the finest machine in the world for hatching theories, absurdities and other un-economic eggs. The brooder in which the chickens were developed is a wonder. It is the McAdoo patent, which is an improvement of the Adamson, and is warranted to produce insatiable appetites. The Director, who was not the owner of the farm, fed the chickens war-inflated wages. When more feed was needed than the farm would produce it was carted from the U. S. Treasury. Now the owners have possession of their farm, and are obliged to feed the vulture-like chickens the manager left behind. Worse yet; more of the brood are daily coming back to roost. The owners are obliged to keep them, but are not permitted to change the feed to peace-time corn, even though all the farm produces will not provide for them, and they even eat up the few eggs that are laid. The owners, in despair ask how they shall pay taxes, insurance, upkeep of the farm and make improvements when all it produces is eaten up. But the vultures swarm to the roosts and cluck and gabble for more.—*The Wall Street Journal Straws.*

Railway Financial News

ANN ARBOR.—*Authorized to Pledge Bonds.*—This company has been authorized by the Interstate Commerce Commission to pledge \$100,000 of its improvement and extension mortgage bonds with the War Finance Corporation as substitute security for a demand note.

CANADIAN NATIONAL RAILWAYS.—*Deficit for 1920.*—Hon. J. D. Reid, minister of railways, made his annual statement on the operation of the Canadian Government Railways before the Canadian House of Parliament on March 17. Dr. Reid first outlined the policy of management decided upon when the Canadian Northern was connected up with the Intercolonial and Transcontinental Railways, describing how the board of management was constituted. A year ago, he said, he announced the deficit of 1919, on Government lines as \$47,993,312. When final figures were available, the actual loss was found to have been \$48,242,536. Continuing he said:

When I made my annual statement of the operation of these roads a year ago, I believed from discussions I had with the management I would be able to advise the House this year that the deficit of 1919 had been reduced in 1920. Instead of a reduction, I must inform the House that the loss in operation alone for the year ending December 31, 1920, is much larger. It follows: Canadian Northern, \$16,258,580; Canadian government, \$10,449,876; total, operating deficit of the Canadian National Railways, \$26,708,456. To which we add the operating deficit of the Grand Trunk Pacific, which, since last August 23, has been under management of the Canadian National Board, amounting to \$10,134,514, making a total operating deficit of \$36,842,970.

To this must be added the interest on bonds, etc., or what are called fixed charges, and which have been paid or assumed by the government, and are as follows: Canadian Northern, \$24,155,988; Grand Trunk Pacific, \$9,332,776; making the total deficit for operation and fixed charges \$70,331,735.

And this does not take into consideration any interest or fixed charges on Transcontinental or Intercolonial railways.

A Canadian National income credit, which will be shown in the statement of detail, reduces this sum to \$69,593,441, which is the loss on operation and fixed charges for 1920, as against 48 millions in 1919.

The total mileage operated by the Canadian National management at the end of 1920 was 17,054.69 miles. There were added during 1920, 140 miles by purchase and 236 miles on completion of new construction.

The income statement of the Canadian National Railways for the calendar years ended 1920 and 1919 was given as follows:

GROSS EARNINGS		
C. N. R.	\$66,695,599	1920
Can. government	44,537,804	\$53,562,178
G. T. P.	14,408,560	1919
Totals	\$125,641,753	\$105,036,177
OPERATING EXPENSES		
C. N. R.	\$82,953,079	1920
Can. government	54,987,680	\$60,034,024
G. T. P.	24,543,063	47,728,206
Totals	\$162,484,722	\$125,349,797
OPERATING DEFICITS		
C. N. R.	\$16,258,580	1920
Can. government	10,449,876	\$6,471,846
G. T. P.	10,134,514	7,458,825
Totals	\$36,842,970	\$26,292,950
FIXED CHARGES		
C. N. R. due public	\$13,837,118	1920
Interest due government	10,318,870	\$12,693,584
G. T. P. due public	6,048,951	7,276,126
Interest due government	2,475,474	6,048,850
Interest on receiver's certificates for 1920	808,352	1,910,265
Totals	\$33,488,765	\$27,928,925
TOTAL DEFICIT (OPERATING AND FIXED CHARGES)		
C. N. R.	\$40,414,568	1920
Can. government	10,449,877	\$26,441,556
G. T. P.	19,467,290	7,548,825
Totals	\$70,331,735	15,252,156

The results of operation of the Canadian National Railways was no worse than obtained outside of Canada, but that did not mean that every effort should not be made to prevent losses. At present the country was faced with permanent fixed charges as follows: Interest, public debt (including sinking fund), \$142,800,000; pensions, \$31,816,000; permanent expenditure for carrying on the affairs of the government (about), \$127,000,000; total (about), \$301,616,000.

This was without a dollar for carrying on necessary public works, soldier

settlement, re-establishment and other expenditure. It meant very heavy taxation for many years, and it would be a very serious matter to have increased taxation for railways to the extent of from \$50,000,000 to \$70,000,000 per annum.

I have not been able to get the annual closing statement from the Grand Trunk management up to the present. I sent an expert auditor to secure from the books and submit a statement as to results of operations for the years 1919 and 1920, and secured the report that, after providing for operating expenses, tax accruals, income deductions, etc., the amount available for interest and dividends was as follows: 1919, \$11,164,036; 1920, \$5,692,301.

Out of the above amounts the railway was able to meet in 1919 the interest on its fixed charges, but not on the share capital, which includes 4 per cent guaranteed steel, first, second and third preference stock and ordinary stock.

In 1920 the company fell short \$6,563,091 of meeting interest on fixed charges. The Grand Trunk, however, had to pay \$3,635,000 to employees for back pay between May 1 and September 1, when no increases for freight rates had been allowed. But the figures of six millions did not take into account a loss of \$19,817,873 on the Grand Trunk Pacific, a subsidiary of the Grand Trunk, for which the Grand Trunk was responsible. The loss on the Grand Trunk Pacific had been included in the deficit for last year on government lines of \$69,593,441.

CANADIAN PACIFIC.—*Annual Report.*—A review of this company's annual report for 1920 appears on another page of this issue.

CHICAGO & EASTERN ILLINOIS.—*Reorganization Plan.*—A tentative draft of the reorganization plan has been distributed to members of the underwriting committee. A general meeting of the committees of bondholders will be held on or about March 31. The foreclosure sale of the road is scheduled for April 5.

Trading on the curb began March 24, when the Chicago & Eastern Illinois new common stock sold for \$13 a share and its preferred stock for \$31, with slight fluctuations.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Ask Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue \$3,493,000 of first and general mortgage 5 per cent gold bonds, to be held in the treasury or to be used for purposes of collateral.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Purchase of E. I. & T. H.*—This road has purchased the entire capital stock of the Evansville, Indianapolis & Terre Haute. The purchase is subject to the approval of the Interstate Commerce Commission.

Spencer Trask & Co. have purchased from a syndicate, represented by Raymond M. Smith, approximately \$500,000 of the Evansville, Indianapolis & Terre Haute Railway Company first mortgage 7s, due May, 1950. These bonds will be sold privately by the bankers at a price to yield about 7.15 per cent.

DENVER & RIO GRANDE.—*Sale Confirmed.*—The sale of this road to the Western Pacific for \$5,000,000 on November 20, 1920, in satisfaction of a judgment for \$36,000,000 obtained by the Equitable Trust Company of New York was confirmed in the federal court at Denver, Col., by District Judge Robert E. Lewis on March 28. The decree provides that William A. Jackson, who was appointed special master on a court order, shall deliver to the purchasers full deeds, all assets and assignments on the payment to the special master of the full amount of money within thirty days or within such time as the court later may designate. The decree also directed that all moneys held at present by A. B. Baldwin, receiver of the road, shall be turned over to the purchasers with the exception of \$100,000 which the receiver is authorized to retain for current expenses. The confirmation definitely disposes of any right of the stockholders to interfere with the road's operation. The payment of the \$5,000,000 in 5 per cent thirty-year gold bonds of the Western Pacific Railroad is given in the confirmatory decree.

Confirmation of the sale of the Denver & Rio Grande will mean its reorganization within the next thirty days, according to Charles M. Levey, president of the Western Pacific. The plans provide for the formation of a new company, the Denver-Rio Grande & Western. It will be operated under the direct supervision of the Western Pacific Company.

In spite of the court confirmation on the sale, the stockholders' protective committee of the Denver & Rio Grande will proceed with its attack on the original matters leading up to the judgment which forced the road's sale.

EL PASO & SOUTH WESTERN.—*No Merger with Rock Island.*—President T. M. Schumacher is quoted as having denied that any steps have been taken to merge this road with the Chicago, Rock

Island & Pacific and part of the Southern Pacific, but as having admitted such a plan would be agreeable to the Phelps-Dodge interests.

ERIE.—*Authorized to Guarantee Equipment Trust Certificates.*—This company has been authorized by the Interstate Commerce Commission to guarantee the prompt payment of principal and dividends on an issue of \$4,370,000 of equipment trust certificates to be issued under an agreement of assignment of lease by the United States Mortgage & Trust Company.

EVANSVILLE, INDIANAPOLIS & TERRE HAUTE.—*Purchased by Big Four.*—See Cleveland, Cincinnati, Chicago & St. Louis.

EVANSVILLE, INDIANAPOLIS & TERRE HAUTE.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue \$400,000 of first mortgage bonds due May 1, 1950, with interest at 7 per cent, to be pledged with the Secretary of the Treasury for a loan.

FORT DODGE, DES MOINES & SOUTHERN.—*Loan from Revolving Fund Approved.*—The Interstate Commerce Commission has approved a loan of \$200,000 to this company for the purpose of assisting it in rebuilding 600 box cars.

GEORGIA & FLORIDA.—*Authorized to Issue Certificates of Indebtedness.*—The receivers have been authorized by the Interstate Commerce Commission to issue \$1,600,000 of receiver's certificates at 8 per cent, dated January 31, 1921, and maturing January 31, 1924; to pledge one-half of the amount with the Secretary of the Treasury as security for a loan; to sell \$600,000 of certificates and to distribute \$200,000 of certificates as payments on account pro-rata of the uncertificated indebtedness of the receivers incurred prior to January 1, 1921.

NEW YORK, NEW HAVEN & HARTFORD.—*Annual Meeting of Stockholders.*—The stockholders' annual meeting will be held in New Haven on April 20. Among matters to be considered are proposition for refunding the indebtedness of the company known as the European Loan which matures April 1, 1922, and to consider the acquiring or merging of the Central New England Railway Company, the Harlem River & Port Chester Railroad, the New England Steamship Company, the Hartford & New York Transportation Company and the New Bedford, Martha's Vineyard & Nantucket Steamboat Company.

READING COMPANY.—*More Petitions to Intervene.*—George S. Ingraham, individually and as attorney for Frances T. Ingraham, Robert S. Ingraham, Mabel B. Ingraham and Marcus L. Taft, holders of 11,000 shares of Reading common stock, has filed a petition in the United States District Court in Philadelphia asking for information from the Reading Company as to the value of their interest in the Reading property. The petition states that under the proposed plan of segregation the petitioners are required to elect as to the assets of the company in which they desire to hold an equitable interest, but that they are unable to make such election intelligently until more definite knowledge of Reading's assets has been provided.

William B. Knotz, a preferred shareholder, has also presented a petition to the court to intervene, suggesting certain modifications in the plan.

RICHMOND TERMINAL.—*Authorized to Issue Notes.*—This company has been authorized by the Interstate Commerce Commission to issue two promissory notes, each in the face amount of \$12,500, payable to the Richmond, Fredericksburg & Potomac and the Atlantic Coast Line.

SACRAMENTO NORTHERN.—*Purchase by Western Pacific.*—See item under Western Pacific.

TEXAS CITY TERMINAL.—*Application for Certificate.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing it to operate the properties formerly owned by the Texas City Transportation Company sold at foreclosure on August 3, 1920.

TOLEDO TERMINAL.—*Authorized to Issue Promissory Notes.*—This company has been authorized by the Interstate Commerce Commission to issue \$72,000 of promissory notes for the acquisition of two freight locomotives.

VIRGINIA BLUE RIDGE.—*Authorized to Issue Notes.*—This company has been authorized by the Interstate Commerce Commission

to issue \$106,000 of promissory notes and to pledge as collateral security \$50,000 of its first mortgage 6 per cent bonds.

WESTERN PACIFIC.—*Purchase of Sacramento Northern Contemplated.*—This road has applied to the Railroad Commission of California for authority to issue \$4,180,000 of its first mortgage 5 per cent gold bonds in connection with its contemplated purchase of the Sacramento Northern Railroad. The bonds are to be exchanged for bonds of the Sacramento Northern, which are now in the hands of the trustee, on the basis of \$80 face value in Western Pacific bonds for \$100 face value of Sacramento Northern bonds. About 90 per cent of the Sacramento Northern stock, amounting to \$4,650,094, has also been deposited with the trustee. The Western Pacific agrees to pay \$27.50 per share for trust certificates representing first preferred stock; \$15 a share for certificates representing the second preferred stock, and \$6 for certificates representing common stock.

See also Denver & Rio Grande above.

Guaranty Certificates Issued

The Interstate Commerce Commission has issued the following certificates for partial payments to railroads on account of their guaranty for the six months following federal control, in addition to those listed last week:

	Previously paid
Chicago, Milwaukee & St. Paul.....	\$2,000,000
St. Louis-San Francisco.....	800,000
St. Louis-San Francisco of Texas.....	200,000
Paris & Great Northern.....	27,500
International & Great Northern.....	260,000
Chicago Junction.....	200,000
Chicago, St. Paul, Minneapolis & Omaha.....	850,000
Kansas City, Clinton & Springfield.....	55,000
Cumberland & Pennsylvania.....	60,000
Brownwood North & South.....	5,500
Fort Worth & Rio Grande.....	210,000
Chicago, Peoria & St. Louis.....	60,000
Spokane, Portland & Seattle.....	250,000
Oregon Electric.....	180,000
New York Central.....	20,000,000
Pacific Coast.....	30,000

The commission has also issued a certificate for a partial payment to the American Railway Express Company on account of its guaranty for \$4,500,000. This company had previously received advances amounting to \$19,700,000.

Dividends Declared

Bangor & Aroostook.—Preferred, 3½ per cent, semi-annually; common, 2 per cent, semi-annually.

Norfolk & Western.—Preferred, 1 per cent, quarterly, payable May 19 to holders of record April 30.

Philadelphia & Trenton.—2½ per cent, quarterly, payable April 12 to holders of record April 1 to April 11.

DURING 1920 the value of the declared exports from Cairo, Egypt, to the United States was \$861,792, as compared with \$411,485 during 1919. Sheepskins, valued at \$215,811 during the past year and \$136,936 in 1919, were the leading items of this trade.—Commerce Reports.

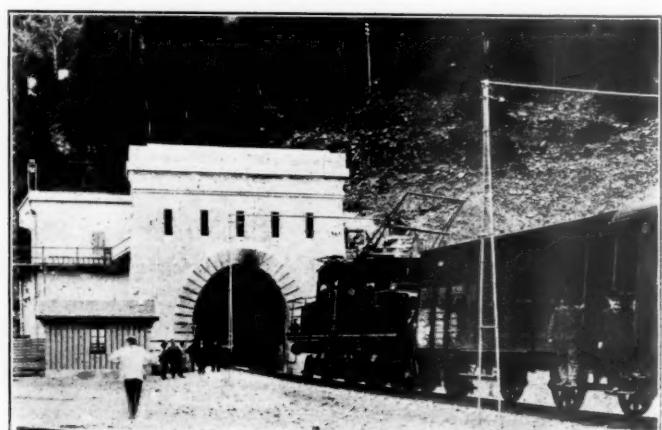


Photo by Keystone

Electric Train About to Enter the Simplon Tunnel, Switzerland

ANNUAL REPORT

Canadian Pacific Railway Company—Fortieth Annual Report

To the Shareholders:

The accounts of the Company for the year ended December 31st, 1920, show the following results:

Gross Earnings \$216,641,349.30
Working Expenses (including all taxes) 183,488,304.70

Net Earnings \$33,153,044.60
Deduct Fixed Charges 10,775,408.99

Surplus \$22,377,635.61
Contribution to Pension Fund 500,000.00

From this there has been charged a half-yearly dividend on Preference Stock of 2 per cent., paid October 1st, 1920. \$1,613,638.42

And three quarterly dividends on Ordinary Stock of 1 1/4 per cent. each, paid June 30th, 1920, October 1st, 1920, and December 31st, 1920 13,650,000.00

15,263,638.42

\$6,613,997.19

From this there has been declared a second half-yearly dividend on Preference Stock of 2 per cent., payable April 1st, 1921. \$1,613,638.42
And a fourth quarterly dividend on Ordinary Stock of 1 1/4 per cent., payable April 1st, 1921. 4,550,000.00

6,163,638.42

Leaving net surplus for the year. \$450,358.77
In addition to the above dividends on Ordinary Stock, three per cent. was paid from Special Income.

SPECIAL INCOME FOR YEAR ENDED DECEMBER 31st, 1920

Balance at December 31st, 1919. \$17,363,844.27

Less: Dividend paid April 1st, 1920. 1,950,000.00

Net Revenue from Investments and Available Resources, Exhibit "C". 2,436,717.25

Interest on Deposits, and interest and Dividends on Other Securities less Exchange. 2,057,327.93

Net Earnings Ocean and Coastal Steamship Lines. 2,741,146.12

Net Earnings Commercial Telegraph and News Department, Rentals and Miscellaneous. 3,731,256.51

\$26,380,292.08

Less: Payments to Shareholders in dividends: June 30th, 1920, October 1st, 1920, and December 31st, 1920. 5,850,000.00

\$20,530,292.08

From this a dividend has been declared payable April 1st, 1921. \$1,950,000.00

2. The working expenses for the year, including all taxes, amounted to 84.70 per cent. of the gross earnings, and the net earnings to 15.30 per cent., as compared with 31.39 per cent. and 18.61 per cent. respectively in 1919.

3. The gross earnings of your transportation system during the fiscal year under review exceeded those of 1919 by \$39,712,289, and the net earnings by \$220,008. This large addition of \$39,492,281 in working expenses is due to the enforced application in Canada of what is known as "The Chicago Wage Award," which added approximately \$12,000,000 to the pay rolls for the year; the increase in the cost of fuel and materials and the charging of the year's Federal taxes into operating expenses, where they properly belong. The heavy and rapid movement of freight during October and November and the first half of December under the tariffs prescribed by the Railway Commission and effective on September 13th enabled your Company to absorb these expenses and earn its usual charges, dividends and a modest surplus. While, for the reasons mentioned, the net earnings are not commensurate with the volume of business transacted, still in the opinion of your Directors the year's operations must be regarded as satisfactory and compare most favorably with those of any other system on the American continent.

4. The sales of agricultural land in the year were 468,390 acres for \$9,592,706.95, being an average of \$20.48 per acre. Included in this area were 47,848 acres of irrigated land which brought \$50.43 per acre, so that the average price of the balance was \$17.07 per acre.

5. During the year your Directors disposed of \$8,000,000 of Four per cent. Consolidated Debenture Stock to the British Government pursuant to arrangements previously made at the time of the deposit of \$40,000,000 of the Stock with the British Treasury in 1917. The balance of the Stock deposited, namely, \$32,000,000 has been returned to the Company and is available for sale or other disposition as circumstances warrant.

6. As indicated in the last annual report, and with your approval, your Directors during the year issued \$12,000,000 of Equipment Trust Notes for the purpose of acquiring necessary additions to your Company's rolling stock.

7. Your approval was obtained in 1919 and 1920 to the construction, as conditions warranted, of branch line mileage in Western Canada amounting in the aggregate to 822 miles, and during the year under review 100 miles of track of this authorized mileage have been laid.

While extensive new construction is not under the present conditions advisable, your Directors are of the opinion that a moderate amount of construction should be proceeded with during the coming year in order that the full value of the lines already under construction should be realized and that the settlers in the districts to be served should obtain the railway facilities so necessary to their prosperity. The Branch Lines heretofore approved are in good territory and well located to become revenue producing.

8. Your approval will be asked to the construction of an extension of the Suffield South-westerly Branch from Lomond, a distance not exceeding thirty miles, and for the issuance and sale of a sufficient amount of Four per cent. Consolidated Debenture Stock to meet the expenditure.

9. Four steamers for Atlantic and Pacific Service previously contracted for are now being built for the Company, namely:—

"Empress of Canada,"
"Montrose,"

"Montcalm."

"Montclare,"

and the "Koenig Friedrich August" has been purchased.

An additional ship for British Columbia Coast Service, required because of the loss of the "Princess Sophia" and "Princess Irene," and the sale of the "Princess May" and "Princess Margaret," is also under construction.

The estimated cost of these six ships is \$31,175,000, of which \$18,733,138 was paid up to 31st December, 1920. The estimated capital requirements on this account for the year and including the amount required for the completion of the payments on the "Koenig Friedrich August" purchased, amount to approximately \$12,200,000. Your approval will be asked to the issuance and sale of a sufficient amount of Consolidated Debenture Stock to meet the expenditure for these vessels. During the year, the S.S. "Sardinian," built in 1875, was sold.

10. In anticipation of your confirmation, your Directors authorized capital appropriations, in addition to those approved at the last annual meeting, aggregating, for the year 1920, \$3,246,318, and, subject to your approval, have authorized expenditures on capital account during the present year of \$4,316,236—of this amount the principal items are:—

Replacement and enlargement of structures in permanent form.	\$509,624
Additional stations, roundhouses, freight sheds and shops and extensions to existing buildings.	398,158
Tie plates, rail anchors, ballasting, ditching and miscellaneous betterments.	35,700
Replacement of rail in main and branch line tracks with heavier section.	1,000,000
Additional terminal and side-track accommodation.	377,292
Extension work on Chateau Frontenac Hotel.	853,000
Lining of Connaught Tunnel.	400,000
Improvements in connection with Telegraph Service.	55,033
Mechanical Department, machinery at various shops.	30,950

The balance of the amount is required for miscellaneous works to improve facilities over the whole system and effect proper economies.

11. In view of the importance to the Company in its personnel and the value to Canada in the development of its resources and industry through the increase in the number of trained technical men, your Directors authorized a subscription to McGill University Endowment of \$250,000, and to the University of Montreal of \$50,000, payable in annual installments. Contributions of \$10,000 to the Salvation Army and \$5,000 to the work of the Y. M. C. A. were also authorized. The value of the work of Salvation Army and the Young Men's Christian Association to the Company and its employees is of direct and indirect importance.

12. At the request of the Government of Alberta, and in order to ensure proper railway service in the districts served by the Edmonton, Dunvegan and British Columbia and Central Canada Railway Companies, your Directors have entered into an agreement with these companies, their stockholders, the Union Bank of Canada, and the Province of Alberta, for the operation, for a period of five years from the Twenty-first day of July, 1920, of the properties of the Edmonton, Dunvegan and British Columbia and Central Canada Railway Companies. The remuneration is the payment to your Company of 15 per cent. of the revenues in excess of working expenses, payable out of profits after payment of fixed charges, and an agreement giving your Company an option to purchase the capital stock on the terms set out in the agreement at any time during the period of five years. The agreement provides that the necessary capital for improvements and betterments to the lines shall be loaned by the Government to the Companies to be operated, and it is estimated that an amount of \$2,500,000 will be required for this purpose, of which \$1,000,000 has already been provided. The value of the arrangement to your Company is that it enables an accurate appreciation to be obtained of the probable development of the country, and the present and prospective value of the properties as traffic contributors to your Company's system. The arrangement is likewise equally desirable from the standpoint of the people of Alberta in that it enables the benefit of a proper railway organization to be obtained and proper railway economies to be effected under the direction of your Company's officers, and at the same time permits the development of the North Country to be aided to the fullest possible extent and gives to present and incoming settlers the railway facilities so essential to their success.

13. In order to ensure the development of that portion of the Province of Quebec situated South and East of Lake Temiskaming, your Directors have entered into an agreement with the Province for the construction by your subsidiary, the Interprovincial and James Bay Railway Company, of a railway extending from Kipawa to Des Quinze River, with a branch to Ville Marie, having a total mileage of 76 miles. Subsidies of \$8,000 a mile in cash for 66 miles and 4,000 acres of land per mile of the entire railway have been voted, which will, of course, substantially reduce the cost of construction to the Company. A productive agricultural area of large extent and valuable timber lands will be opened and served through the construction of this railway.

14. The Preference Stock of the Company deposited with the British Treasury was returned to the owners on the First of October, 1920, and the common stock on the Thirty-first of December.

The position of the holdings of Common Stock as of March First of this year was as follows:—

	Shares	Percentages
United Kingdom	1,242,837	47.80
Canada	460,838	17.73
United States	626,510	24.10
France	79,123	3.04
Other holdings	190,692	7.33
	2,600,000	

15. During the last six and a half years the Company has expended on Capital Account, \$88,000,000; and during the same period the proceeds of the sale of capital issues amounted to \$26,282,000, exclusive of the recent Equipment Issue of \$12,000,000, the proceeds of which have not as yet been received in full because of the non-completion of the rolling stock under contract for construction. In consequence of these large expenditures, the demands upon the Company's cash reserves have been extensive, while the surpluses from railway operations during the past three years, for reasons with which the Shareholders are entirely familiar, have been merely nominal.

As indicated in this report, the capital requirements for 1921, exclusive of payments on steamships and the continuance of branch line construction, will be very moderate. No extensive works are contemplated in the East, save the commencement of the Interprovincial and James Bay Railway, previously referred to, and the continuance of the work on the extensions to the Chateau Frontenac, which it is expected will involve the expenditure of \$853,000 during the present year.

The amount of unissued Consolidated Debenture Stock for the issuance of which your authority has already been given, is \$36,000,000, and the

amount issued and undisposed of is \$32,000,000, a total of \$68,000,000. The capitalization of the Company is conservative and even low, and this has been accomplished largely through the utilization of surpluses in betterments and improvements which would normally have been paid for out of the proceeds of capital issues. While capital expenditures for the immediate future will be curtailed and the resumption of works requiring large amounts of money will be deferred until a decided improvement in business conditions furnishes warrant for incurring them, your Directors consider that it will be desirable that a portion of the cash reserves expended on Capital Account should be restored within a short time, and, to this end, in order to supplement and extend the powers of the Company to issue forms of securities other than those it is already empowered to issue and which are more appropriate to present market conditions, have made application for an amendment to the Company's charter permitting the issuance of bonds, debentures or other securities, collateral to or in lieu of any Consolidated Debenture Stock which the Company is or may hereafter be empowered to issue, and for the same amount, such securities to be payable in such currency, at such times and places, and bearing such interest as your Directors may think proper. As mentioned in the notice to Shareholders, the annual general meeting will be made special for the purpose of authorizing, if approved, the issuance of such securities.

16. The Note Certificates of the Company issued in 1914 for \$52,000,000 will fall due on March 2nd, 1924. Your Directors are glad to be able to advise the Shareholders that ample provision has been made for the retirement of these Notes at maturity.

17. Your Directors desire to express their appreciation of the loyal and efficient services of the officers and men of the Company, which have permitted it to perform its functions as a common carrier with credit to itself and satisfaction to the public, and have resulted in returns from the year's operations which, under the difficult conditions existing, cannot but be regarded as highly gratifying to the Shareholders.

18. The undermentioned Directors will retire from office at the approaching annual meeting. They are eligible for re-election:

Mr. EDWARD W. BEATTY,
Hon. FREDERICK L. BÉIQUÉ, K. C.
Mr. CHARLES R. HOSMER,
Hon. WM. J. SHAUGHNESSY, K. C.
For the Directors.
E. W. BEATTY, President.

MONTREAL, March 14th, 1921.

GENERAL BALANCE SHEET, DECEMBER 31st, 1920.

ASSETS

Property Investment:	
Railway, Rolling Stock Equipment and Lake and River Steamers	\$567,283,037.04
Ocean and Coastal Steamships, Exhibit "A"	43,695,645.26
Acquired Securities (Cost):	
Exhibit "B"	124,469,836.18
Advances to Controlled Properties and Insurance Premiums	10,134,550.14
Investments and Available Resources:	
(Including amount held in trust for 6% Note Certificates, \$60,197,030.76)	
Deferred Payments on Lands and Townsites	\$70,968,761.54
Imperial and Dominion Government Securities	33,916,466.81
Provincial and Municipal Securities	2,016,721.29
Debenture Stock in Treasury	32,000,000.00
Miscellaneous Investments, Exhibit "C," Cost	35,056,459.66
Assets in Lands and Properties, Exhibit "D"	91,977,838.03
Cash	6,871,549.71
	272,807,797.04
Working Assets:	
Material and Supplies on Hand	\$33,734,639.66
Agents' and Conductors' Balances	4,298,448.79
Net Traffic Balances	6,011,475.62
Imperial, Dominion and United States Governments, Accounts due for Transportation, etc.	1,110,084.55
Miscellaneous Accounts Receivable	11,751,730.11
Cash in Hand	30,090,941.24
	86,997,319.97
	\$1,105,388,185.63

AUDITORS' CERTIFICATE.

We have examined the Books and Records of the Canadian Pacific Railway Co. for the year ending December 31st, 1920, and having compared the annexed Balance Sheet and Income Account therewith, we certify that, in our opinion, the Balance Sheet is properly drawn up so as to show the true

RECEIPTS AND EXPENDITURES.

Year Ended December 31st, 1920.

Receipts:	
Cash in hand, December 31st, 1919	\$53,519,420.78
Surplus Revenue as per statement	21,877,635.61
Special Income as per statement	10,966,447.81
	32,844,083.42
Land Department:	
Lands and Townsites:	
Proceeds of Sales and Interest, less cancellations	\$12,867,526.96
Less Sales Expenses and Irrigation	4,706,321.08
	\$8,161,205.88
Deferred Payments on previous years' sales	3,383,543.88
	11,544,749.76
Amount remaining in Deferred Payments on the sales of the year	7,692,372.99
Amount received from Sale of Government and other Securities	3,852,376.77
Amount on account of Consolidated Debenture Stock, sold to the Imperial Government	3,801,113.75
Amount applied in reduction of Cost of Mining and other Properties, Exhibit "D"	7,658,578.54
Increase in Current Liabilities, Rentals of Leased Lines and Coupons on Mortgage Bonds, Equipment Obligations and Reserves and Appropriations	38,682.69
	22,929,153.78
	\$124,643,409.73

EXPENDITURES

Dividends on Preference Stock:	
2 per cent. paid April 1st, 1920	\$1,613,638.42
2 per cent. paid October 1st, 1920	1,613,638.42
	\$3,227,276.84
Dividends on Ordinary Stock:	
2½ per cent. paid April 1st, 1920	\$6,500,000.00
2½ per cent. paid June 30th, 1920	6,500,000.00
2½ per cent. paid October 1st, 1920	6,500,000.00
2½ per cent. paid December 31st, 1920	6,500,000.00
	26,000,000.00
Construction of Branch Lines, Exhibit "E"	4,248,213.28
Additions and Improvements, main line and branches, Exhibit "F"	6,702,262.68
Expenditure on leased and acquired lines, Exhibit "G"	1,852,004.60
Rolling Stock Equipment	4,461,152.98
Shops and Machinery	1,485,737.30
Lake and River Steamers	74,910.00
Ocean and Coastal Steamships:	
Payments on Steamships acquired and under construction	\$14,255,914.25
Less amount paid from Steamship Replacement Fund	454,441.42
	13,801,472.83
Deposited with Trustee, Special Investment Fund	7,021,866.59
Securities Acquired:	
Lake Erie & Northern Ry. 1st Mortgage Bonds	\$11,000.00
Alberta Stock Yards Co., Ltd., Preferred Stock	129,000.00
Trustee Securities	3,294,244.81
	3,434,244.81
Payment of Equipment Obligations	1,440,000.00
Increases in Working Assets and Advances to Controlled Properties and Insurance Premiums	20,803,326.58
Cash in hand, December 31st, 1920	\$94,552,468.49
	30,090,941.24
	\$124,643,409.73

GENERAL BALANCE SHEET, DECEMBER 31st, 1920.

LIABILITIES	
Capital Stock:	
Ordinary Stock	\$260,000,000.00
Four Per Cent. Preference Stock	80,681,921.12
	\$340,681,921.12
Four Per Cent. Consolidated Debenture Stock	216,284,882.10
Mortgage Bonds:	
Algoma Branch 1st Mortgage 5 per cent.	3,650,000.00
Note Certificates, 6 Per Cent.	52,000,000.00
Current:	
Audited Vouchers	\$19,429,625.95
Payrolls	4,886,048.37
Miscellaneous Accounts payable	13,376,745.54
	37,692,419.86
Accrued:	
Rentals of Leased Lines and Coupons on Mortgage Bonds	648,855.71
Equipment Obligations	\$18,550,000.00
Less Balance on hand with Trustees	10,979,600.00
	7,570,400.00
Reserves and Appropriations:	
Equipment Replacement	\$4,230,786.45
Steamship Replacement	22,922,912.60
Reserve Fund for Contingencies and for Contingent War Taxes	49,160,236.19
	76,313,935.24
Premium on Ordinary Capital Stock Sold	45,000,000.00
Net Proceeds, Lands and Townsites	96,610,805.14
Surplus Revenue from Operation	127,725,728.35
Special Reserve to Meet Taxes Imposed by Dominion Government	3,144,249.81
Surplus in Other Assets	98,064,988.30
	\$1,105,388,185.63

J. LESLIE, Comptroller.

financial position of the Company at that date, and that the relative Income Account for the year is correct.

PRICE, WATERHOUSE & CO., Chartered Accountants (England).

Montreal, March 14th, 1921.

EXHIBIT "F."

DETAILS OF EXPENDITURE ON ADDITIONS AND IMPROVEMENTS FROM JANUARY 1ST TO DECEMBER 31st, 1920.	
Eastern Lines:	
Additional Sidings, Buildings, Stations and Yards	\$460,357.68
Permanent Bridges and Improvements of Line	652,653.09
	\$1,113,010.77
Montreal Terminals	574,101.41
Quebec Joint Terminals	28,706.21
Western Lines:	
Additional Sidings, Buildings, Stations and Yards	\$1,024,804.93
Permanent Bridges and Improvements of Line	1,152,172.15
Fort William Terminals, including Coaling Plant	197,862.29
Winnipeg Terminals	71,200.16
Vancouver Terminals	585,483.08
Connaught Tunnel	508,607.89
Right of Way	11,427.20
	\$3,551,557.70
Additions to Office Buildings and Hotels	564,280.93
Rented and Temporary Sidings	253,452.57
Telegraph Extensions and Additions	617,153.09
	\$6,702,262.68

STATEMENT OF EARNINGS FOR THE YEAR ENDED DECEMBER 31st, 1920.			
From Passengers	\$49,125,738.88		
" Freight	145,303,399.70		
" Mails	1,498,231.14		
" Sleeping Cars, Express and Miscellaneous.....	20,713,979.58		
Total	\$216,641,349.30		

STATEMENT OF WORKING EXPENSES FOR THE YEAR ENDED DECEMBER 31st, 1920.			
Transportation Expenses	\$86,608,611.54		
Maintenance of Way and Structures.....	32,573,927.27		
Maintenance of Equipment.....	46,350,792.61		
Traffic Expenses	4,999,345.21		
Parlor and Sleeping Car Expenses.....	2,492,640.78		
Expenses of Lake and River Steamers.....	1,492,991.54		
General Expenses (including all taxes).....	8,969,995.75		
Total	\$183,488,304.70		

DESCRIPTION OF FREIGHT FORWARDED,
Years Ended December 31st

	1918	1919	1920
Flour Barrels	13,301,740	12,787,020	9,644,410
Grain Bushels	137,070,428	121,059,921	172,536,485
Live Stock Head	2,364,870	2,603,571	1,947,976
Lumber Feet	3,241,312,802	3,143,431,200	3,565,175,867
Firewood Cords	339,631	279,925	272,546
Manufactured Articles. Tons	9,718,373	7,854,163	9,330,111
All other articles....Tons	9,798,523	7,589,275	9,625,065

FREIGHT TRAFFIC

	1918	1919	1920
Number of tons carried....	29,856,694	25,102,821	30,160,134
Number of tons carried one mile	13,014,665,922	11,121,322,012	13,994,508,975
Earnings per ton per mile... .05 cents	0.85 cents	1.00 cents	1.04 cents

TRAIN TRAFFIC STATISTICS—FOR TWELVE MONTHS ENDED DECEMBER 31st, 1920 AND 1919
EARNINGS OF LAKE AND RIVER STEAMERS AND OF KETTLE VALLEY RAILWAY NOT INCLUDED IN THIS STATEMENT

PASSENGER TRAFFIC.

	Year ended Dec. 31, 1920	Year ended Dec. 31, 1919	Amount or number	Increase or —Decrease
Passengers carried (earning revenue).....	16,769,555	15,671,752	1,097,803	7.01
Passengers carried (earning revenue) one mile.....	1,718,084,609	1,763,604,596	—45,519,987	—2.58
Passengers carried (earning revenue) one mile per mile of road.....	132,223	135,727	—3,504	—2.58
Average journey per passenger.....miles	102.45	112.53	—10.08	—8.96
Average amount received per passenger.....\$	2.89	2.91	—.02	—.69
Average amount received per passenger mile.....cts.	2.82	2.59	.23	8.88
Average number of passengers per train mile.....	76.75	78.89	—2.14	—2.71
Average number of passengers per car mile.....	15.91	15.58	.33	2.12
Revenue from passengers per passenger car mile.....cts.	44.88	40.32	4.56	11.31
Total passenger train earnings per train mile.....\$	2.81	2.59	.22	8.49
Total passenger train earnings per mile of road.....\$	4,844.78	4,463.87	380.91	8.53

FREIGHT TRAFFIC.

	1918	1919	1920
Tons of revenue freight carried one mile.....	13,856,607,551	10,926,848,494	2,929,759,057
Tons of non-revenue freight carried one mile.....	1,830,407,240	1,378,437,805	451,969,435
Total tons (all classes) freight carried one mile.....	15,687,014,791	12,305,286,299	3,381,728,492
Tons of revenue freight carried one mile per mile of road.....	1,066,401	840,928	225,473
Tons of non-revenue freight carried one mile per mile of road.....	140,868	106,084	34,784
Total tons (all classes) freight carried one mile per mile of road.....	1,207,269	947,012	260,257
Average amount received per ton per mile of revenue freight.....cts.	1.038	1,003	.035
Average No. of tons of revenue freight per train mile.....	529.25	498.07	31.18
Average No. of tons of non-revenue freight per train mile.....	69.91	62.83	7.08
Average No. of tons of (all classes) freight per train mile.....	599.16	560.90	38.26
Average No. of tons of revenue freight per loaded car mile.....	23.44	22.08	1.36
Average No. of tons of non-revenue freight per loaded car mile.....	3.10	2.79	.31
Average No. of tons of (all classes) freight per loaded car mile.....	26.54	24.87	1.67
Freight train earnings per loaded car mile.....cts.	24.34	22.15	2.19
Freight train earnings per train mile.....\$	5.50	5.00	.50
Freight train earnings per mile of road.....\$	11,072.83	8,434.11	2,638.72

[Adv.]

intendent of the Missouri division with headquarters at Poplar Bluff, Mo., succeeding W. C. Morse. **O. E. Coyne** has been appointed superintendent of the Illinois division with headquarters at Illmo, Mo., succeeding H. H. Berry. The appointments are effective April 1.

Railway Officers

Financial, Legal and Accounting

H. C. Hicks has been elected treasurer of the St. Louis, El Reno & Western, with headquarters at St. Louis, Mo. **L. A. Garner** has been appointed auditor with headquarters at Fort Smith, Ark.

George C. Gahan, whose appointment as general auditor of the Canadian Pacific was announced in the *Railway Age* of March 18 (page 741), was born December 28, 1874, at Montreal, Que. He entered the service of the Canadian Pacific in April, 1890, and continued until January 1, 1901, occupying various positions in the accounting department. On the latter date he was appointed general bookkeeper and continued in that position until July, 1901, when he was promoted to chief clerk to the assistant comptroller and general auditor. In December, 1916, Mr. Gahan was promoted to assistant general auditor, which position he was holding at the time of his recent promotion.

Operating

The office of general superintendent of the Fort Worth & Denver City has been transferred from Fort Worth, Tex., to Wichita Falls and the office of superintendent of the Wichita Falls division has been abolished. Officers and employees formerly reporting to the superintendent of this division will hereafter report directly to the general superintendent. These changes are effective April 1.

A. Miller, district engineer on the Missouri Pacific with headquarters at Kansas City, Mo., has been appointed super-

Traffic

J. F. Gracey has been appointed general agent on the Louisville & Nashville with headquarters at Clarksville, Tenn., effective April 1.

D. F. Williams has been appointed general freight and passenger agent of the St. Louis, El Reno & Western, with headquarters at Fort Smith, Ark.

J. A. Dolan has been appointed general agent on the Erie, with headquarters at Cincinnati, Ohio, effective March 1, succeeding J. H. Webster, who has resigned.

L. K. Mulkern has been appointed division freight agent of the Canadian Pacific with headquarters at North Bay, Ont., succeeding **W. S. Elliot**, who has been transferred to a similar position at St. John, N. B.

R. N. Collyer has been appointed vice-chairman of the Traffic Executive Committee, Eastern territory, with headquarters at New York. Mr. Collyer will continue as chairman of the Trunk Line Association.

J. H. Regal, general baggage agent of the Oregon-Washington Railroad & Navigation Company, has been given jurisdiction over the duties of general baggage agent of the San Francisco & Portland Steamship Company, with headquarters at Portland, Ore.

F. W. Jones, general agent of the Norfolk & Western, with headquarters at Richmond, Va., has been appointed division freight agent with headquarters at Winston-Salem, N. C.,

succeeding F. T. Brinkley who has retired under the pension rules of the company. D. W. Champlin has succeeded Mr. Jones as general agent at Richmond. These changes were effective March 19.

Mechanical

E. J. Summers, smoke inspector on the Chicago, Milwaukee & St. Paul, has been promoted to fuel supervisor, with headquarters at Chicago, effective March 15, with jurisdiction over the system.

M. B. McPartland has been appointed superintendent of motive power of the Denver & Salt Lake with headquarters at Denver, Colo., succeeding J. J. Connors, resigned on account of ill health.

J. W. Small, formerly superintendent of motive power of the Seaboard Air Line, has been appointed superintendent of motive power and shops of the Cuba Railroad with headquarters at Camaguey, Cuba, succeeding M. B. McPartland, resigned, to accept service with another company. Mr. Small was born on September 24, 1870, at Chatham, Ont., and was educated in the high schools of that city and at the Collegiate Institute. He entered railway service in 1887 as a machinist's apprentice on the Northern Pacific. In 1892 he went to Pocatello, Idaho, as a machinist on the Oregon Short Line. The following year he went to Tacoma, Wash., as a machinist for the

Northern Pacific. During the same year he entered the service of the Southern Pacific as a machinist and served subsequently as gang foreman, roundhouse foreman, assistant master mechanic and master mechanic for that company. In 1906 he became superintendent of motive power of the Mexican lines of the Southern Pacific. In 1910 he went to the Kansas City Southern in a similar capacity and the following year became superintendent of motive power for the Missouri Pacific. The same year he went with the Sunset Central Lines (Galveston, Harrisburg & San Antonio, Houston & Texas Central, Morgan's Louisiana & Texas, Texas & New Orleans, etc.) as assistant general manager. In 1913 he was appointed superintendent of motive power of the Seaboard Air Line. During federal control he served first as mechanical assistant to the regional director, Southern region, and later as mechanical staff officer to the regional director of the same region.

Engineering, Maintenance of Way and Signaling

E. K. Hatten has been appointed assistant engineer of the Georgia & Florida with headquarters at Augusta, Ga. The office of chief engineer has been abolished.

G. H. Ballantyne, resident engineer of the Western Pacific with headquarters at Sacramento, Calif., has been appointed acting chief engineer with headquarters at San Francisco, Calif., succeeding T. J. Wycke, who has been granted a leave of absence on account of ill health.

A. L. Grandy, assistant general manager of the Pere Marquette, with headquarters at Detroit, Mich., has been appointed chief engineer and the position of assistant general manager has been abolished. J. Tuttle, chief engineer, has been appointed assistant chief engineer.

Purchasing and Stores

A. Herrera, formerly purchasing agent of the National Railways of Mexico, with headquarters at Mexico City, has been appointed to his former position. Mr. Herrera was born September 16, 1878, at Mexico City. He was educated at the Merchants' School of that city and entered railway service March 1, 1895, with the Mexican Central. After serving in several minor positions in the stores department he was appointed chief clerk of that department in 1901. In 1903, he was promoted to material accountant and served in that capacity until 1906 when he was appointed fuel agent. In 1909 when the Mexican Central was incorporated into the National Railways of Mexico, Mr.

Herrera's duties were extended to include the maintenance of the fuel service of the entire system. In 1910 he was appointed purchasing agent. Mr. Herrera continued in this position until 1915 when, because of the revolution, he retired to private life. With the return of normal conditions he has again resumed the duties of his office.



A. Herrera



J. W. Small

Obituary

Charles H. Cox, assistant treasurer of the Ann Arbor, died on March 27, at Toledo, Ohio.

Thomas M. Orr, assistant secretary of the Union Pacific, died at his home in Omaha, Neb., on March 19, after an illness of several weeks. He had been with the Union Pacific for over 40 years.

A. C. Torbert, secretary and treasurer of the Gulf, Colorado & Santa Fe, was found dead in his berth on a Santa Fe train at Houston, Tex., on the morning of March 24. Mr. Torbert had been in the service of the Gulf, Colorado & Santa Fe for 34 years. He was born at Newtown, Pa., on July 4, 1859, and was educated at Racine College, Racine, Wis. He entered railway service in March, 1882, on the Missouri Pacific at Galveston, Tex. In 1885 he went with the Texas & Pacific, and after being employed for two years in the auditor's office at Dallas, Tex., entered the service of the Gulf, Colorado & Santa Fe at Galveston. He was promoted to cashier and paymaster in July, 1887, and ten years later was made secretary and treasurer, the position which he was holding at the time of his death.

F. A. Lister, formerly superintendent on the Galveston, Houston & Henderson, died at his home in Galveston, Tex., on March 23. Mr. Lister was born at Philadelphia, Pa., in 1849. He entered railway service at the age of 14 years as a messenger on the Philadelphia & Reading at Philadelphia. He later became a station clerk and subsequently station agent for this company. At the age of 24 he was appointed superintendent of the Camden & Atlantic (now part of the Pennsylvania). He later saw service on the National Railways of Mexico, the Missouri Pacific at Little Rock, Ark., the St. Louis-Southwestern at Cairo, Ill., and Tyler, Tex., the San Antonio & Aransas Pass at San Antonio and Yoakum, Tex., and the Colorado & Southern at Denver, Colo. In 1897 he went with the Galveston, Houston & Henderson as agent at Galveston and was later promoted to superintendent. He served for a time as acting general manager. In 1912 Mr. Lister met with an accident which resulted in the loss of his right foot, and since that time he had not been in active service.